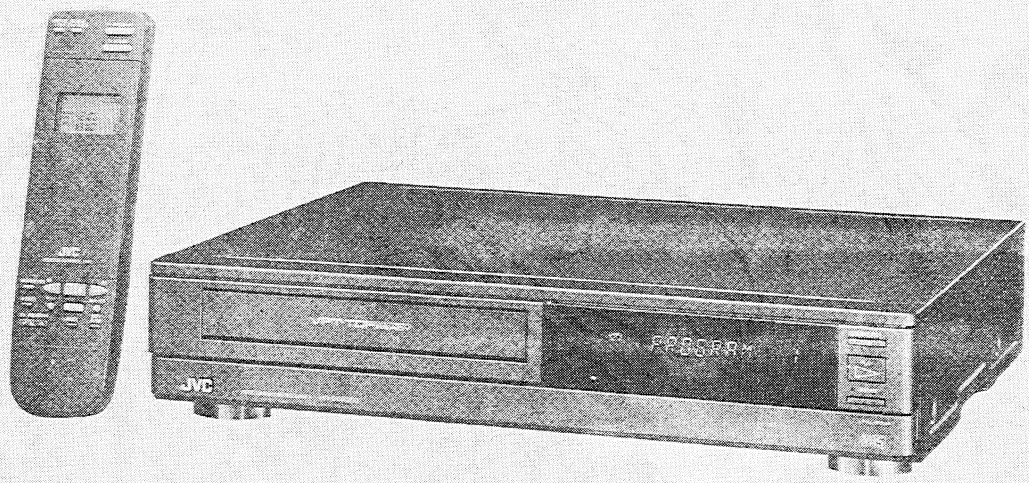
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER VHS

HR-D560E/EG



SPECIFICATIONS

GENERAL

Power requirement	:	AC 220 – 240 V~, 50/60 Hz
Power consumption	:	29 W
Temperature	:	5°C to 40°C (Operating)
	:	–20°C to 60°C (Storage)
Operating position	:	Horizontal only
Dimensions (WxHxD)	:	435 x 94 x 335 mm
Weight	:	5.2 kg
Format	:	VHS PAL standard
Tape width	:	12.65 mm
Tape speed	:	23.39 mm/sec
Maximum recording time	:	240 min. with E-240 video cassette

VIDEO

Signal system	:	PAL colour and CCIR monochrome signals, 625 lines/50 fields
Recording system	:	Rotary two-head helical scan system
Input	:	0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output	:	1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio	:	43 dB (Rohde & Schwarz noise meter)
Horizontal resolution	:	250 lines

AUDIO

Recording system	:	Longitudinal track
Input	:	–3.8 dBs, (CENELEC standard) more than 50 k-ohms, unbalanced
Output	:	–3.8 dBs, (CENELEC standard) less than 1 k-ohm, unbalanced (100 k-ohms, load)
Frequency range	:	70 Hz to 10,000 Hz

TUNER

Tuning system	:	Frequency synthesized tuner
TV channel storage capacity	:	48 positions (+ AUX position "AU")
Channel coverage	:	VHF 47 — 111 MHz 111 — 300 MHz 302 — 470 MHz (Hyper band for PAL)
		UHF 470 — 862 MHz
Aerial output	:	UHF channel 36 (adjustable 32 — 40)

TIMER

Clock reference	:	Quartz-crystal
Programme capacity	:	1-year/8-programme timer
Memory backup time	:	60 min.

ACCESSORIES

Provided accessories	:	Aerial cable Infrared remote control unit "R6" battery x 2
Optional accessories (EG)	:	VPV adapter VU-V120E VPT adapter VU-V140E
Optional accessories (E)	:	VPS adapter VU-V110E VPV adapter VU-V120E VPS/VPV adapter VU-V100E VPT adapter VU-V140E VPS/VPT adapter VU-V150E

Design and specifications subject to change without notice.

COPYRIGHT © 1991 VICTOR COMPANY OF JAPAN, LTD.

No. 82235
March 1991

TABLE OF CONTENTS

Section	Title	Page
	Important Safety Precautions	
	INSTRUCTIONS	
	1. DISASSEMBLY AND MECHANISM ADJUSTMENTS	
1.1	DISASSEMBLY	1-1
1.2	MECHANISM ADJUSTMENTS	1-4
1.3	MAIN MECHANISM PARTS	1-5
1.4	INSPECTION AND MAINTENANCE	1-7
1.5	MAIN PARTS REMOVAL AND REPLACEMENT	1-8
	2. ELECTRICAL ADJUSTMENTS	
2.1	PREPARATION	2-1
2.2	SWITCHING REGULATOR CIRCUIT	2-3
2.3	TIMER CIRCUIT	2-3
2.4	SERVO CIRCUIT	2-4
2.5	VIDEO CIRCUIT	2-5
2.6	AUDIO CIRCUIT	2-8
2.7	TUNER/IF CIRCUIT	2-9
	3. CHARTS AND DIAGRAMS	
3.1	CIRCUIT BOARD AND LOCATION	3-1
3.2	GENERAL INFORMATION	3-2
3.3	BOARD INTERCONNECTIONS	3-5
3.4	VIDEO BLOCK DIAGRAM	3-7
3.5	PRE/REC BLOCK DIAGRAM	3-9
3.6	SERVO BLOCK DIAGRAM	3-11
3.7	AUDIO BLOCK DIAGRAM	3-13
3.8	SYSTEM CTL BLOCK DIAGRAM	3-15
3.9	SWITCH REGULATOR & REGULATOR (MAIN) SCHEMATIC DIAGRAMS	3-17
3.10	SWITCHING REGULATOR CIRCUIT BOARD	3-19
3.11	SERVO SCHEMATIC DIAGRAM	3-21
3.12	SERVO (MAIN) CIRCUIT BOARD	3-23
3.13	AUDIO SCHEMATIC DIAGRAM	3-25
3.14	AUDIO (MAIN) CIRCUIT BOARD	3-27
3.15	SYSTEM CTL SCHEMATIC DIAGRAM	3-29
3.16	MECHACON (MAIN) CIRCUIT BOARD	3-31
3.17	TERMINAL SCHEMATIC DIAGRAM	3-33
3.18	TERMINAL (MAIN) CIRCUIT BOARD	3-34
3.19	DECK TERMINAL, MODE MOTOR, CAPSTAN MDA AND CASS. HOUSING SCHEMATIC DIAGRAMS	3-35
3.20	DECK TERMINAL, LOADING MDA, CASS. HOUSING AND A/CTL HEAD CIRCUIT BOARDS	3-36
3.21	MAIN CIRCUIT BOARD	3-37
3.22	VIDEO UNIT & VIDEO (MAIN) SCHEMATIC DIAGRAMS	3-39
3.23	VIDEO UNIT & VIDEO (MAIN) CIRCUIT BOARDS	3-41
3.24	TUNER UNIT SCHEMATIC DIAGRAM	3-43
3.25	TUNER UNIT CIRCUIT BOARD	3-45
3.26	TIMER/DISPLAY/SW SCHEMATIC DIAGRAM	3-47
3.27	TIMER/DISPLAY/SW CIRCUIT BOARD	3-49
3.28	PRE/REC SCHEMATIC DIAGRAM	3-51
3.29	PRE/REC CIRCUIT BOARD	3-53
3.30	REMOTE CONTROL SCHEMATIC DIAGRAM	3-55
3.31	RF CONVERTER SCHEMATIC DIAGRAM	3-56
	4. EXPLODED VIEWS AND PARTS LIST	
4.1	PACKING ASSEMBLY <M1>	4-1
4.2	CABINET ASSEMBLY <M2>	4-2
4.3	CHASSIS ASSEMBLY <M3>	4-3
4.4	MECHANISM ASSEMBLY <M4>	4-4
4.5	REMOTE CONTROL UNIT <M5>	4-6
	5. ELECTRICAL PARTS LIST	
	SWITCH REGULATOR BOARD ASSEMBLY <01>	5-1
	MAIN BOARD ASSEMBLY <03>	5-2
	VIDEO UNIT BOARD ASSEMBLY <05>	5-7
	TUNER UNIT BOARD ASSEMBLY <07>	5-9
	AUDIO CONTROL HEAD BOARD <12>	5-11
	TIMER/DISPLAY/SW BOARD ASSEMBLY <21>	5-11
	UPPER DRUM BOARD <41>	5-12
	PRE/REC AMP BOARD ASSEMBLY <43>	5-12
	DECK TERMINAL BOARD ASSEMBLY <51>	5-13
	LOADING MDA BOARD ASSEMBLY <55>	5-13
	CASSETTE HOUSING BOARD <56>	5-13
	6. TECHNICAL INFORMATIONS	
6.1	CPU pin functions	6-1

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

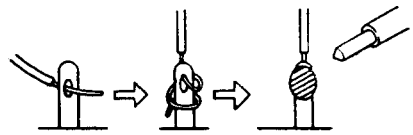


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

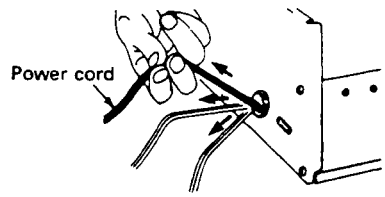


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

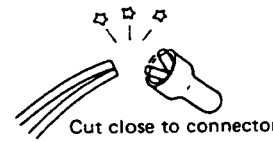


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

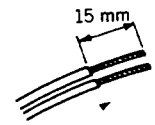


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

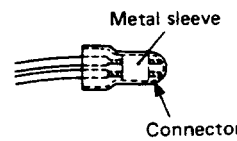


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

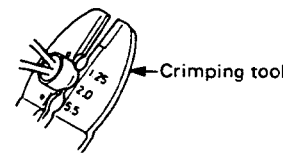


Fig. 6

(5) Check the four points noted in Fig. 7.

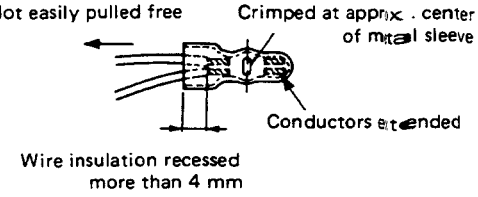

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

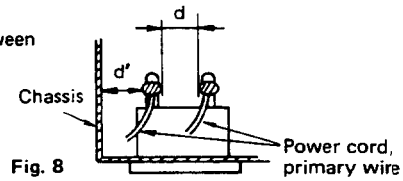


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

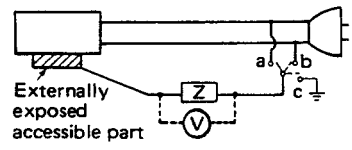


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

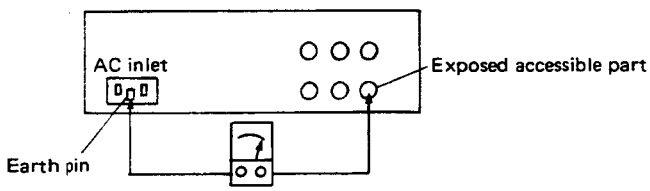


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

Safety Precautions

The rating plate and the safety caution are on the rear of the unit.

WARNING — DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT (In the United Kingdom)
Mains Supply (240 V~, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with the following code:

Blue to N (Neutral) or Black
Brown to L (Live) or Red

If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt — consult a competent electrician.

Omkopplaren OPERATE på denna apparat är sekundärt kopplad och skiljer inte apparaten från nätet i läge OPERATE OFF.

The OPERATE button does not completely shut off mains power from the unit, but switches operating current on and off.

BEMAERK: I stilling OFF er apparatet stadig forbundet med lysnettet Hvis det ønskes fuldstændig afbrudt skal netledningen trækkes ud.

This unit is produced to comply with Directives 76/889/EEC, 82/499/EEC, 87/308/EEC and Standard IEC Publ. 65.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

WARNING

There are two different types of SECAM colour systems: SECAM-L, used in FRANCE (also called SECAM-West), and SECAM-B, used in Eastern European countries (also called SECAM-East).

1. This recorder can also receive SECAM-B colour television signals for recording and playback.
2. Recordings made of SECAM-B television signals produce monochrome pictures if played back on a video recorder of SECAM-L standard, or do not produce normal colour pictures if played back on a PAL video recorder with SECAM-B system incorporated (even if the TV set is SECAM-compatible).
3. SECAM-L prerecorded cassettes or recordings made with a SECAM-L video recorder produce monochrome pictures when played back with this recorder.
4. This recorder cannot be used for the SECAM-L standard. Use a SECAM-L recorder to record SECAM-L signals.

IMPORTANT: It may be unlawful to record or play back copyrighted material without the consent of the copyright owner.

VHS PAL HQ

- Only cassettes marked "VHS" can be used with this video recorder.
- HQ VHS is compatible with existing VHS equipment.

COPYRIGHT © 1991 VICTOR COMPANY OF JAPAN, LTD.

Contents

Controls, Indicators, And Connectors 3
Getting To Know Your Video Recorder 5

Getting Started With Your Video Recorder
Making The Right Connections 7
Handling Video Cassettes 8
Setting The Clock 9
Setting The Tuner 10

Basic Operation Of Your Video Recorder
Playback 11
Recording 12
Timer-Recording 13
Mode Displays — What They Mean 15

Advanced Functions On Your Video Recorder
For Playback 16
For Recording 17
For Tape Access 18
For Timer-Recording 19
For Editing 23

Managing Your Video Recorder
Special Operations 25
Using The Optional Teletext Adapter 27

Full List Of Display Panel Messages 28
Precautions 29
Specifications 30
Special Note On Head Cleaning 30
In Case Of Difficulties 31

How To Use This Instruction Manual

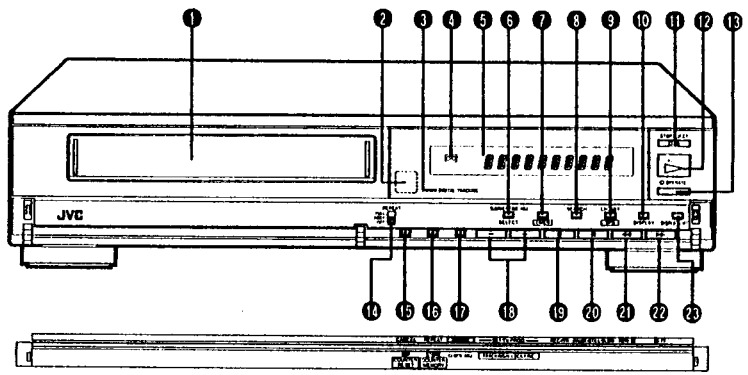
This instruction manual has been designed with both new and experienced users in mind. The first half offers detailed, step-by-step instructions for setting up your video recorder, and on using its basic functions. The second half provides instructions on the many other functions available on your video recorder. So just by following the instructions on the "Getting Started" and "Basic Operation" sections of this manual, you can master all of your recorder's basic functions, including timer-recording. Once you're sufficiently familiar with basic operation, or if you're already an experienced video user, you can move on to the more advanced functions introduced on the following pages. Related features have all been clustered together for easy reference, and their categories (playback, recording, timer, etc.) are easily recognisable by the symbol appearing in the page header. If you ever need to refer to another page for instructions or information, you will be told so by a ☞ mark pointing to the page number.

Remember, you must use your video recorder correctly to fully enjoy it. Please use this manual effectively. It's the surest and quickest way to unlock the full potential of your new JVC video recorder.

This instruction manual covers two model versions: "EG" and "E". Be sure to check which model you have purchased.
EG: VPS decoder built-in.
E: VPS decoder not built in. You must connect an optional adapter to take advantage of VPS service. ☞ p.22

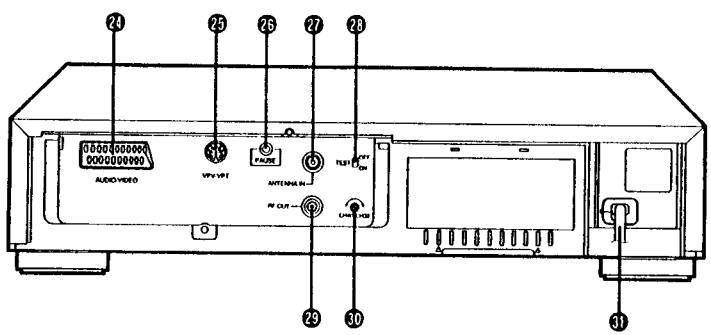
Controls, Indicators, And Connectors

Front Panel



❶ Cassette loading slot
❷ Infrared beam sensor window
❸ DIGITAL TRACKING indicator
❹ "Cassette loaded" indicator
❺ Message display panel ☞p.15, 28
❻ SUMMER TIME ADJ./SELECT button
❼ TIMER button
❽ SEARCH button
❾ CH SET/VPS button
❿ DISPLAY button
⓫ STOP/EJECT button
⓬ PLAY button
⓭ OPERATE button with LED indicator
⓮ REPEAT (FULL/INDEX/OFF) switch
⓯ CANCEL/SKIP/COUNTER RESET button
⓰ REPEAT/STORE/COUNTER MEMORY button
⓱ PROGRAM/CLOCK ADJ. button
⓲ SET/TV PROG./TRACKING/ V.LOCK/FINE buttons
⓳ REC/ITR button
⓴ PAUSE/STILL/SLOW button
㉑ REW (Rewind) button
㉒ FF (Fast Forward) button
㉓ DISPLAY OFF button

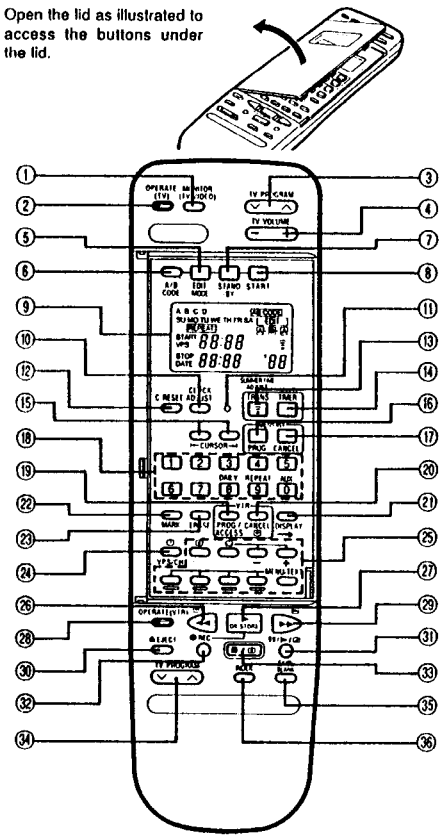
Back Panel



㉔ AUDIO/VIDEO connector
㉕ VPV/VPT (VPS/VPV/VPT) connector
㉖ REMOTE PAUSE terminal.
㉗ ANTENNA IN terminal
㉘ TEST switch
㉙ RF OUT terminal
㉚ RF output channel adjustment screw ☞p.7
㉛ Power cord

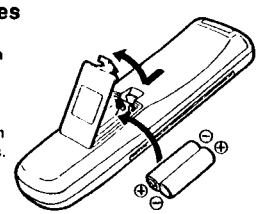
Wireless Remote Control

Open the lid as illustrated to access the buttons under the lid.



Installing Batteries

1. Slide the battery compartment cover in the direction of the arrow.
2. Insert 2 "R6"-size batteries (provided) in the correct directions.
3. Replace the cover.



TV Operation (designated TV models only)
① MONITOR (TV/VIDEO) button
② OPERATE (TV) button
③ TV PROGRAM ∨/∧ button
④ TV VOLUME −/+ button

A/B Code Changing and Duet Editing
⑤ EDIT MODE button ☞p.24
⑥ A/B CODE button ☞p.24
⑦ STAND BY button ☞p.24
⑧ START button ☞p.24

LCD, Timer, Tuner and Tape Counter
⑨ LCD (Liquid Crystal Display)
⑩ LCD CLOCK ADJUST button ☞p.9
⑪ LCD RESET hole
⑫ C. (Counter) RESET button
⑬ TRANS (Transfer)/SUMMER TIME ADJUST button ☞p.9
⑭ TIMER button ☞p.14
⑮ CURSOR buttons ☞p.9
⑯ MEMORY PROG (Program) button
⑰ MEMORY CANCEL button
⑱ Multi-Purpose Numeric keys
⑲ VTR PROG. (Program) button
⑳ VTR CANCEL button
㉑ DISPLAY button

Special Functions
㉒ MARK button ☞p.18
㉓ ERASE button ☞p.18
㉔ VPS/CH button

Teletext Operation
㉕ Teletext Operation buttons
(These buttons function only when an optional teletext adapter (☞p. 27) is connected to your video recorder.)

Basic Operation
㉖ Rewind (◄◄) button
㉗ Play (►) button
㉘ OPERATE (VTR) button
㉙ Fast Forward (►►) button
㉚ EJECT button
㉛ Pause/Still/Slow button (❚❚/►) button
㉜ Record (● REC) button
㉝ Stop (■) button
㉞ TV PROGRAM ∨/∧ button
㉟ SKIP/BLANK button
㊱ INDEX button ☞p.18

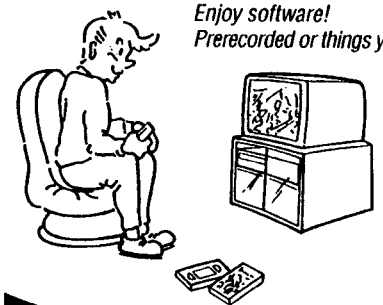
NOTE:
Some buttons have additional labels (mostly pictograms) for teletext operations. You will find instructions for these in the Instruction Manual of the teletext adapter.

How To Use
The remote control can operate most of your video recorder's functions, as well as basic functions of designated JVC TV sets.
- Point the remote control at the sensor window.
- The maximum operating distance of the remote control is about 8 m.

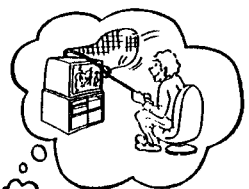
NOTE:
If necessary, you can clear and initialise the LCD memory by inserting a pointed object such as a pencil in the LCD RESET hole ⑪ and pushing the switch located inside. Normally, there is no need to touch this switch.

Getting To Know Your Video Recorder

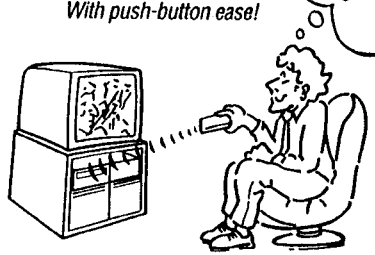
The 3 Basic Ways Of Using Your Video Recorder



Enjoy software!
Prerecorded or things you've recorded!

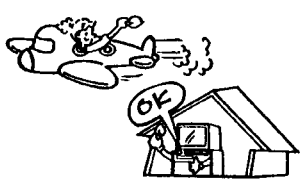


Catch a TV programme!
With push-button ease!



Playback

With the video recorder properly hooked-up to your TV set, viewing videos is as easy as pushing the Play button. Prerecorded VHS software is available just about anywhere, and your video recorder will let you enjoy it all. And, of course, you can enjoy those programmes you've recorded yourself too.



Record TV programmes while you're away.
Watch TV programmes when you want.

Recording

Just press the Record and Play buttons together on your remote control. The recorder will record whatever it is that you're watching. In other words, you can instantly "catch" a TV programme in progress to see it again later, show it to someone else, or keep it as part of your video library. Recording is possible for 4 hours on a single E-240 cassette.

Timer-Recording

By using the built-in timer, you can set your video recorder to record TV programmes for you while you're asleep, while you're away, or while you're doing something else. Then you can watch those programmes later, whenever it's convenient, whenever you want. This is what's called "timeshifting", and now you can do it the JVC way.

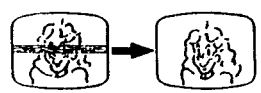
Some Other Functions On Your Video Recorder

"Message" Display Panel

The video recorder "talks" to you from its message display panel. It's easy to understand what the recorder is doing at any time — a friendlier way to interact with your video deck.

Repeat Playback

Automatic repeated playback of the whole tape or a programme segment. Lets you enjoy those favourite scenes and favourite songs again and again.

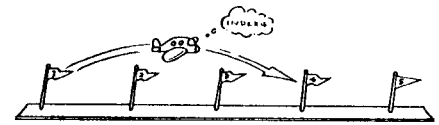


Digital Tracking

Automatically controls video tracking to maintain the best video picture, even with tapes with excessive tracking variations. A must for rental software viewing.

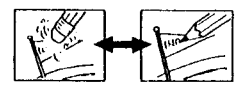
Auto Head Cleaner

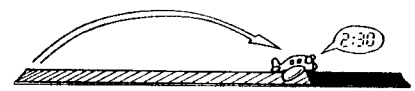
A built-in head cleaner automatically cleans the video heads and head drum whenever a tape is loaded or unloaded to reduce head clogging.



Index Search

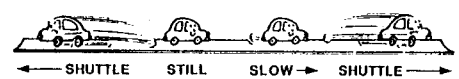
Zooms to the index code number you specify. Easy location of index-coded programmes at the touch of a button. Index codes are automatically marked by the recorder at the beginning of each recording. With index mark/erase, you can also add or delete index codes as you wish.





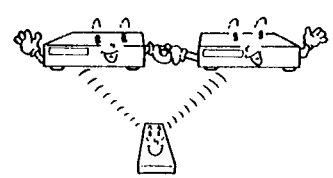
Blank Search

Lets you find the beginning of a non-recorded section automatically when you want to record on a partially-recorded tape. No more blind searching. Automatically displays the tape's remaining time too.



Still/Slow/Shuttle Search

Lets you stop the action or slow it down for a closer look at fast-moving sequences. Search for a specific scene at high speed in either direction.



Duet Editing

Synchronized editing control over two JVC video recorders using one remote control.

Making The Right Connections

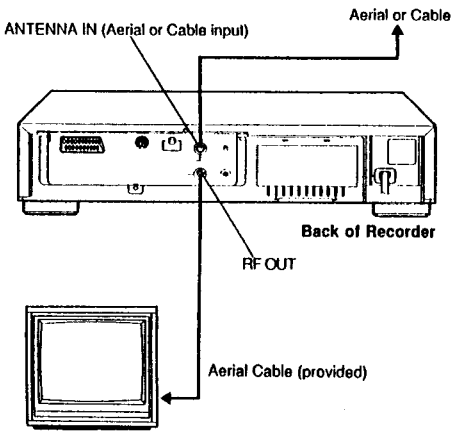
It's essential that your video recorder be properly hooked up for proper results. Follow these steps carefully. THESE STEPS MUST BE COMPLETED BEFORE ANY VIDEO OPERATION CAN BE PERFORMED.

A RECORDER-TO-TV CONNECTION

RF CONNECTION

For TV sets without AV input terminals:

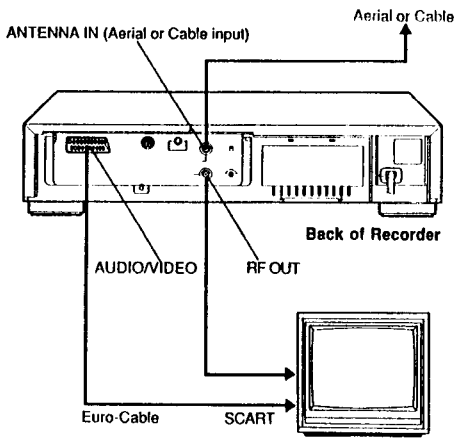
1. Connect the TV aerial cable to the recorder.
2. Connect the recorder to the TV's aerial terminal.



AV CONNECTION

For TV sets with AV input terminals:

1. Connect the aerial, recorder and TV as per "RF CONNECTION".
2. Connect the recorder to the TV's 21-pin SCART connector.

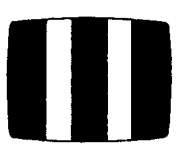


B ADJUST VIDEO CHANNEL (UHF 36)

With an RF connection, the video recorder sends picture and sound signals through the connecting cable to your TV on UHF channel 36. Fine-adjust the RF converter to match your TV.

TEST SIGNAL

1. Turn on the recorder.
2. Set the TEST switch to ON.
3. Set your TV to UHF channel 36 and fine-adjust it until you bring in the two vertical white bars on the screen most clearly.
4. Reset the TEST switch to OFF.



NOTE:

If some interference noise is seen on the screen because of broadcasts on neighbouring channels, it is necessary to shift the video channel from UHF channel 36. This is possible for UHF channels 32 through 40. Consult your JVC dealer for making this adjustment.

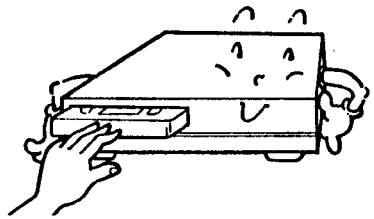
IMPORTANT:

To operate the recorder with your TV using an RF connection, it is always necessary to set your TV's channel to UHF channel 36 (or adjusted channel). With an AV connection, set the TV to the VIDEO (or AV) mode.

Handling Video Cassettes

A LOADING A CASSETTE

1. Insert a cassette with its label side facing you.
   - If the cassette is not loaded firmly it will be ejected.



B UNLOADING A CASSETTE

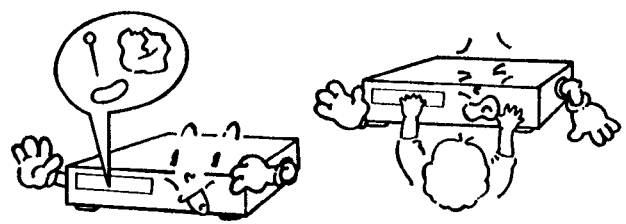
1. Press EJECT.
   - If the cassette will not eject, check to see if "TIMER" is displayed on the message display panel. If it is, press the TIMER button to turn it off.

NOTES:

- Be sure to insert the cassette firmly into the slot; otherwise it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

WARNING

- Do not insert fingers or foreign objects into the cassette loading slot since this could lead to injury or damage to the mechanism. Be especially careful with children.
- Do not try to pull out a cassette once automatic loading has started.



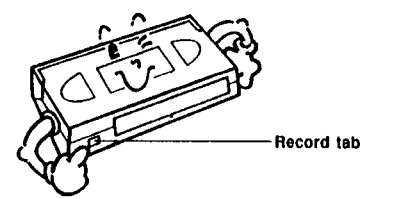
Usable Cassettes And Their Recording Times

This video recorder can record on regular VHS and Super VHS cassettes. However, it will record and play back regular VHS video signals only. It is not possible to play back a recorded Super VHS tape.

Type of Cassette	Recording/Playback Time
E-30	30 minutes
E-60	1 hour
E-90	1 hour, 30 minutes
E-120	2 hours
E-180	3 hours
E-240	4 hours

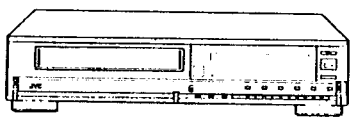
Accidental Erasure Prevention

To prevent accidental recording on a recorded cassette, remove its record tab. To record on it later, cover the hole with adhesive tape.

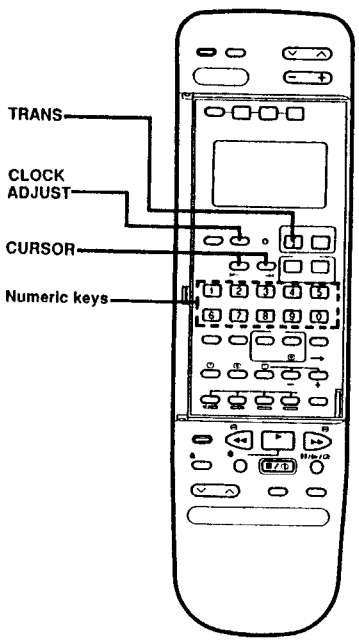


Setting The Clock

Since your video recorder bases all of its timer recording start and stop "decisions" on the time kept by its built-in clock, accurate setting of this clock is crucial for proper timer-recording results. And, since the remote control's LCD clock and the recorder's clock must be set to the same time, this chapter describes the most convenient way of setting both clocks -- setting the LCD clock and transferring its contents to the recorder's clock.

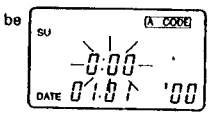


PLUG IN RECORDER



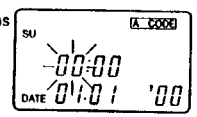
A LOAD BATTERIES (☞p.4)

1 Check the LCD.
- The time display section (0:00) will be blinking.



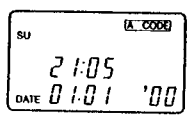
B START CLOCK SETTING

2 Press CLOCK ADJUST.
- Blinking digits will prompt you to items that can be set.



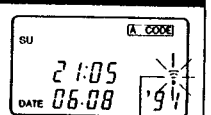
C INPUT THE TIME

3 Press the appropriate numeric keys.
- Example: For 21:05, press 2 1 0 5. Always enter "0" before single-digit entries.



D INPUT THE DAY/MONTH/YEAR

4 Press the appropriate numeric keys.
- Example: For 6th August, 1991, press 0 6 0 8 9 1. Always enter "0" before single-digit entries.
- After setting the year, the transfer-ready mark will appear and blink.



Transfer-ready mark

E TRANSFER AND START THE CLOCK

5 Press TRANS.
- The day of the week will automatically appear.
- The remote control's clock will start. At the same time, the set data will be transferred to the recorder.

TO MAKE CORRECTIONS

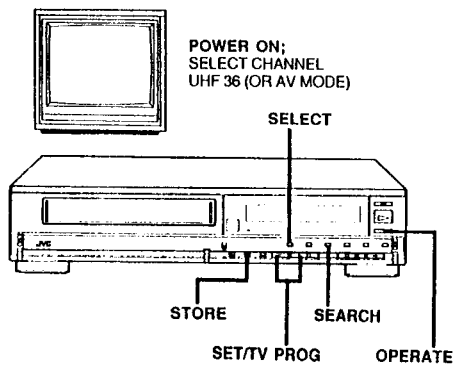
Press either CURSOR button so that the item you want to change blinks.

NOTE:

If you wish to set the recorder's clock directly *referring to the message display, ☞p.25. For quick* "summer time" (Daylight Saving Time) adjustment, ☞ p.25.

Setting The Tuner

The procedure introduced here lets you assign receivable channels in your area to channel positions on your video recorder's tuner. Once stored, these can be accessed with the TV PROGRAM ∨/∧ button. During channel scanning, empty tuner channel positions will be skipped so you won't have to go through any "blank" channels to get to the one you want.

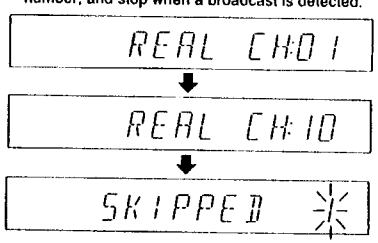


A TURN ON THE RECORDER

1 Press OPERATE.

B SEARCH FOR RECEIVABLE CHANNELS

2 Press SEARCH.
- Automatic scanning will start at the lowest channel number, and stop when a broadcast is detected.

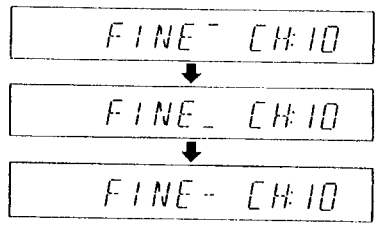


- Regular channels (CH) are scanned first, then cable channels (CC).

C FINE-TUNE THE CHANNEL

- Check the picture on the TV screen, and fine-tune it if necessary. When the picture is clear, proceed to Step D.

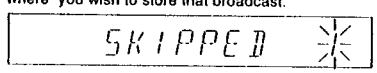
3 Press SELECT.
4 Press SET (+ or –) so that the "–" sign appears at the centre.



5 Press SELECT.

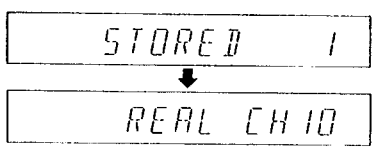
D SELECT A TUNER POSITION

6 Press TV PROG to select the tuner channel position where you wish to store that broadcast.



E STORE THE CHANNEL

7 Press STORE.



- This message indicates that VHF channel 10 has been stored into the tuner's channel position 1.

F CONTINUE

8 Repeat steps 2 through 7 for other receivable channels.

TO CHANGE PRESET CHANNELS

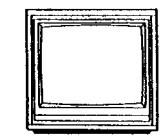
- If you have already preset some channels, do not use the automatic Channel Search function to change or add channels. ☞ p.26.

Notes:

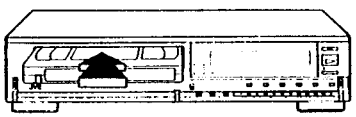
- If you don't want to store the broadcast detected in Step B, simply press SEARCH to continue automatic scanning. Search will stop as soon as another broadcast is detected.
- Be sure to proceed to the next step within 10 seconds, otherwise Channel Search will be cancelled automatically. If this happens and you wish to continue channel setting, press SEARCH again. Channel scanning will resume, beginning with the next receivable channel.

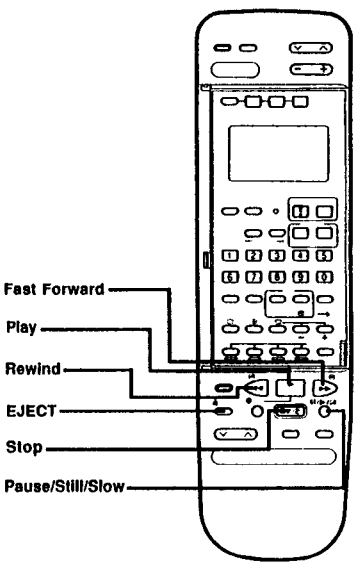
Playback

The easiest, most basic operation possible with your video recorder is tape playback. Already-recorded signals on a video tape are read by your video recorder and displayed on your TV just like a TV programme.



POWER ON;
SELECT CHANNEL
UHF 36 (OR AV MODE)





A TURN ON THE RECORDER

1 Insert a cassette.
- The recorder power will come on automatically.
- If the record tab on the cassette is removed, playback will start automatically.

B TO START PLAYBACK

2 Press ► (Play).

C TO STOP PLAYBACK

3 Press ■ (Stop).

D TO REWIND OR FAST-FORWARD

1 Press ◄◄ (Rewind) to rewind the tape.
2 Press ►► (Fast Forward) to fast-forward the tape.
- Press ■ (Stop) to stop rewind or fast-forward.

E TO EJECT THE TAPE

3 Press EJECT.

High-Speed Forward And Reverse Search

During Playback:

1 Press ►► (Fast Forward) for high-speed forward search.
2 Press ◄◄ (Rewind) for high-speed reverse search.
3 Press ► (Play) to resume normal playback.
- For short searches, keep ►► (Fast Forward) or ◄◄ (Rewind) pressed for more than 2 seconds. When released, normal playback will continue.

Still Playback And Frame Advance

During Playback:

1 Press II/I► (Pause/Still/Slow) to view a still picture.
2 Press again to advance the picture frame by frame.
3 Press ► (Play) to resume normal playback.

Slow Motion

During Playback:

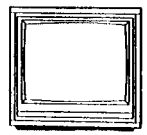
1 Press II/I► (Pause/Still/Slow) for 2 seconds.
2 Press again to stop the picture.
3 Press ► (Play) to resume normal playback.

NOTES:

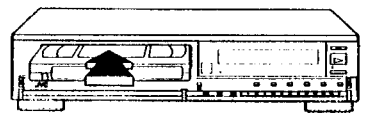
- The recorder automatically stops when still continues for more than 5 minutes.
- If the still picture is unstable (vertical jitter) use the recorder's V. LOCK buttons to correct the picture.
- During search playback, some noise bars will appear.
- If noise bars appear during playback, correct using manual tracking. ☞ p.16.
- There is no audio during search, still, frame-by-frame, or slow motion playback.
- The recorder automatically rewinds when the end of the tape is reached.

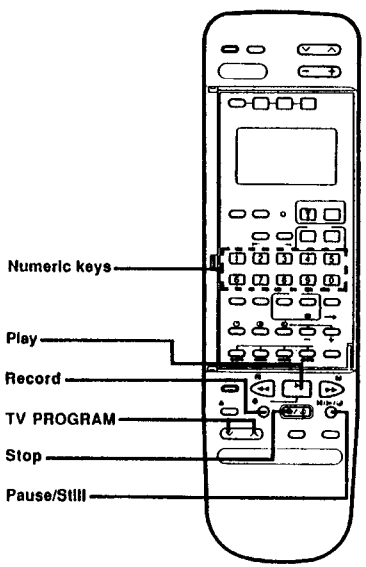
Recording

TV signals being received by the recorder's built-in tuner can be recorded onto a video tape. This is realtime video recording.



POWER ON;
SELECT CHANNEL
UHF 36 (OR AV MODE)





A TURN ON THE RECORDER

1 Insert a cassette with the record tab in place.
- The recorder power will come on automatically.

B CHOOSE A PROGRAMME

2 Press TV PROGRAM or the numeric keys to select the channel you wish to record.

C TO START RECORDING

3 Press ● REC (Record) and ► (Play) simultaneously.

D TO PAUSE RECORDING

1 Press II/I► (Pause/Still).
2 Press ► (Play) to resume recording.

E TO STOP RECORDING

3 Press ■ (Stop).

To Watch Another Programme While Recording

During Record:

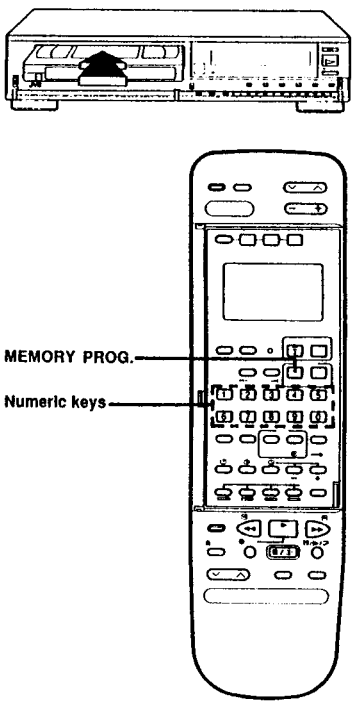
1 Use the channel controls on the TV to select the other channel you wish to view.
- The programme selected with the TV channel controls will appear on the TV screen while the one selected with the video recorder's channel controls will be recorded on the tape.

NOTES:

- To start recording with the recorder's REC/ITR button, press it once on its own. Pressing REC/ITR more than once activates the Off-Timer. ☞ p.17.
- After pause, when recording is resumed, a few frames recorded before the pause may be overlapped by the new recording. This is meant to reduce picture distortion and is not a malfunction.
- The recorder automatically stops when record-pause continues for more than 5 minutes.
- If the Record button does not work, check to see if the cassette's record tab has been removed.
- When a VPS programme is being broadcast on the selected channel, "VPS" appears on the display panel. ☞ p.22 for information on VPS.
- The channel cannot be changed while recording is in progress. To change the channel, engage the record-pause mode, then change the channel.
- The recorder automatically rewinds when the end of the tape is reached during recording.

Timer-Recording

The LCD timer programming method introduced here is one of the two possible with your video recorder, and may be the one you will find most convenient. The programmed data is held in memory even after it has been transferred to the recorder. If you prefer to use the recorder's controls and message display panel, ☞ p.19. TIMER PROGRAMMING IS NOT POSSIBLE UNLESS THE CLOCK HAS BEEN SET.

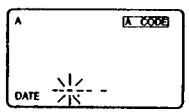


A TURN ON THE RECORDER

1 Insert a cassette with the record tab in place.
- The recorder power will come on automatically.

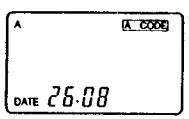
B ACCESS THE LCD TIMER PROGRAM

2 Press MEMORY PROG. (Program A)
- Four programs (A, B, C, and D) are available. To select another program, press MEMORY PROG.



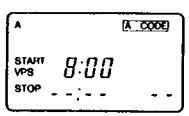
C INPUT THE DATE

3 Press the appropriate numeric keys.
- Example: For 26th August, press 2 6 0 8.



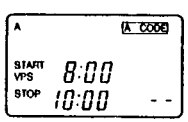
D INPUT THE START TIME

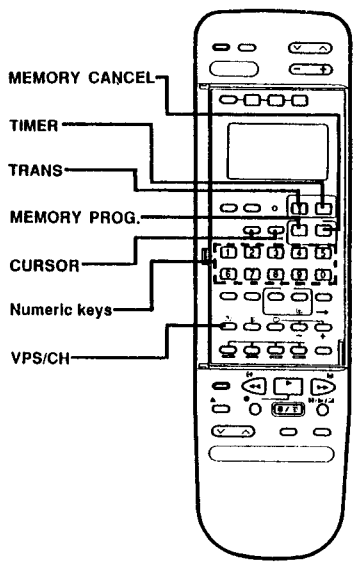
4 Press the appropriate numeric keys.
- Example: For 8:00, press 0 8 0 0.



E INPUT THE STOP TIME

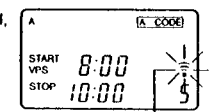
5 Press the appropriate numeric keys.
- Example: For 10:00, press 1 0 0 0.





F INPUT THE CHANNEL NUMBER

6 Press the appropriate numeric keys.
- Example: For channel 5, press 5.
- After the channel has been entered, the transfer-ready mark will appear and blink.
- Normally, you should leave "VPS" on so you can take advantage of VPS recording*. You can cancel VPS by pressing the VPS/CH button whenever the memory program is open. If you have any questions about VPS, ☞p.22.



G TRANSFER THE DATA TO THE RECORDER

7 Press TRANS with the remote control directed to the recorder's Remote Sensor window.
- You will see "PROGRAM 1" on the display panel, telling you that the data has been successfully transferred to the recorder's Program 1 memory.

H SET TO TIMER MODE

8 Press TIMER.
- The recorder will enter the timer mode and power will go off.
- Press TIMER again to release the timer mode.

Variations in Step C (Weekly Program)

This function lets you set the recorder to timer-record at the same time on the same day every week. Use it to record weekly serials.
- First press numeric key "9" (REPEAT) and then enter the date.

Variations in Step C (Daily Program)

This function lets you set the recorder to timer-record at the same time every day. Use it to record daily serials.
- To record a daily serial starting on the day of setting, press numeric key "8" (DAILY) and then press CURSOR → until the display changes to time input mode.
- To record a daily serial starting on a certain day, press numeric key "8" (DAILY) and then enter the date.

TO MAKE CORRECTIONS

- Press either CURSOR button so that the item you want to change blinks, and enter new data.

TO CANCEL PRESET PROGRAMS

1 Press MEMORY PROG. to call up the program you wish to cancel (A – D).
2 Press MEMORY CANCEL.

For other timer programming methods, ☞ p.19.
Any questions? ☞ p.21.

* VPS adapter is required with "E" version.

MODE Mode Displays — What They Mean

Message Display Panel

The operation mode is displayed on the recorder's display panel automatically. Displayed messages are designed to be self-explanatory. Here are some of the more common displays:

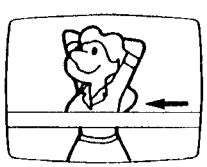
DISPLAY	MODE	DISPLAY	MODE
PLAY	Play	PAUSE (with channel number)	Record-Pause
STILL	Still	FWD SEARCH	Forward Search
FF	Fast-Forward	REV SEARCH	Reverse Search
REW	Rewind	FWD SLOW	Forward Slow
REC (with channel number)	Record	EJECT	Eject
TIMER REC	Timer-Recording	STOP	Stop

For a more comprehensive list, ☞ p.28.

On-Screen Display

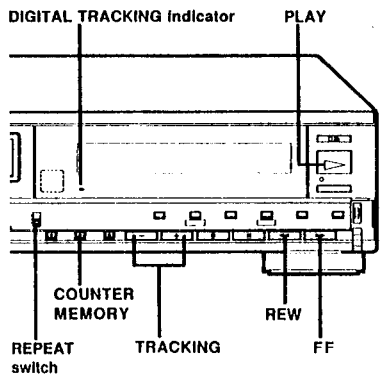
The record-pause mode is also displayed on the TV screen in the form of a white horizontal bar.

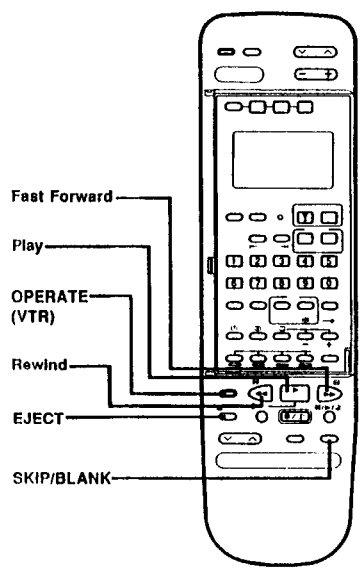
- The bar reduces in size to let you know how long the record-pause mode has continued.
- The record-pause mode is automatically released after about 5 minutes.



For Playback

Take advantage of special functions possible with the recorder's controls or the remote control.





NOTE:
When a new tape is inserted, the recorder enters the automatic tracking mode automatically.

Repeat Playback (Recorder)

Your video recorder can automatically play back the whole tape or an index-marked portion 5 times repeatedly.

1. Set the REPEAT switch to FULL or INDEX.
2. For Index Repeat playback, locate the index code at which you wish to start playback. (Index Search, ☞p.18.)
3. Press PLAY. Repeated playback will start. After repeating 5 times consecutively, playback will stop.
   - Be sure to reset the REPEAT switch to OFF before pressing the PLAY button again; otherwise repeat playback will resume.

Manual Tracking (Recorder)

Your video recorder is equipped with automatic tracking control; the DIGITAL TRACKING indicator lights or blinks when automatic tracking is on. If you wish to adjust tracking manually during playback:

1. Press TRACKING (+ and –) simultaneously for manual override.
   - The DIGITAL TRACKING indicator will go out.
2. Press TRACKING (– or +) to adjust tracking when required.
3. Press TRACKING (+ and –) simultaneously to return to automatic tracking.

To adjust tracking during slow motion, simply press TRACKING (– or +) to obtain the best picture.

Memory Play (Recorder and Remote Control)

For automatic start of playback after tape is rewound:

1. Press REW.
2. Press PLAY within 2 seconds.

For automatic power off after tape is rewound:

1. Press REW.
2. Press OPERATE (VTR) within 2 seconds.

Memory Play (Recorder)

For automatic start of playback beginning at counter position "0:00:00":

1. Press COUNTER MEMORY.
2. Press REW (or FF).
3. Press PLAY within 2 seconds.

Memory Eject (Remote Control)

For automatic tape eject after tape is rewound:

1. Press ◄◄ (Rewind).
2. Press EJECT within 2 seconds.

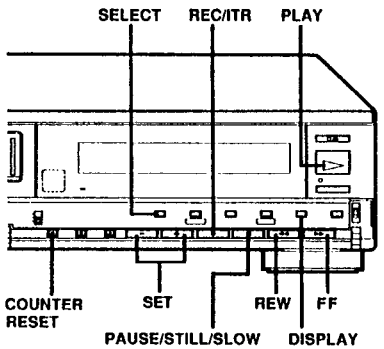
Skip Search (Remote Control)

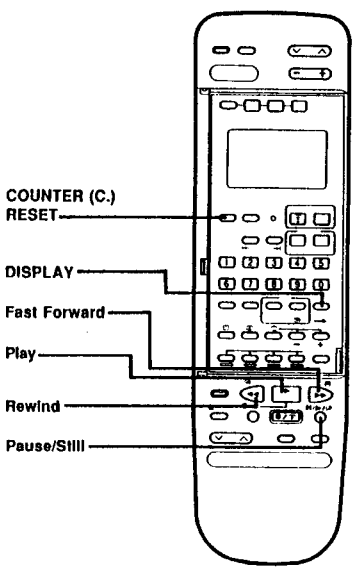
Your recorder offers a simple way of skipping over unwanted sections of recorded TV programmes.

During Playback:

1. Press SKIP/BLANK from 1 to 4 times.
   This fast-motions through 30-sec. to 2-min. of tape.
   - Playback resumes automatically.
   - Press ► (Play) to cancel a Skip Search midway.

For Recording





NOTES:

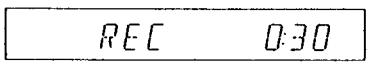
- With Retake, rainbow noise may occur in the rewound and re-recorded section.
- The indicated remaining time is only approximate.

Instant Timer Recording (Off Timer) (Recorder)

You can start a recording and then set the recorder to shut off automatically after a set duration.

During Record:

[1] Press REC/ITR (on the recorder). A "REC 0:30" indication appears, advising that power will switch off after 30 minutes.



[2] Press REC/ITR again to delay the off-time by 30-minute increments (up to 4 hours).
- For a more precise setting, use the SELECT/SET buttons to set the exact time required (possible up to 4 hours and 59 minutes).

Retake (Recorder and Remote Control)

You can cut out unwanted parts of a TV programme while you're recording it.

During Record:

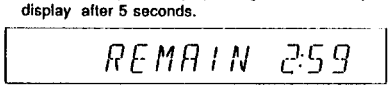
[1] Press PAUSE/STILL/SLOW.
[2] Press FF or REW for normal-speed search in the corresponding direction.
- Release to return to Record-Pause mode.

[3] Press PLAY when you wish to resume recording.

Remaining Tape Time Indication (Recorder and Remote Control)

When you need to know the tape's remaining time.

[1] Press DISPLAY until "REMAIN" appears. Approximate remaining tape time is displayed.
- The remaining time display changes back to the previous mode display after 5 seconds.



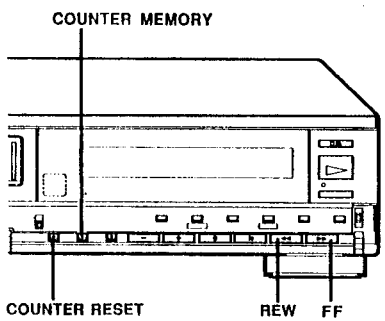
Elapsed Recording Time Indication (Recorder and Remote Control)

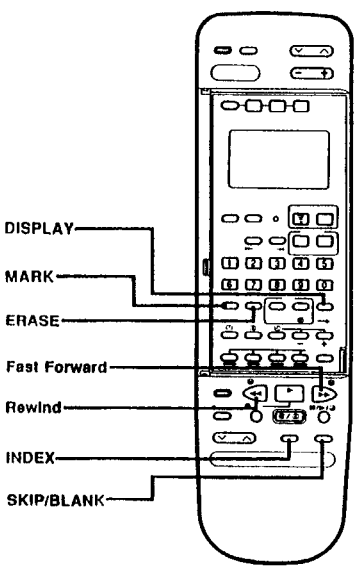
When you need to know the exact time of a recording.

[1] Press DISPLAY until a counter reading appears.
[2] Press COUNTER RESET and then start recording.
- The counter will be reset to "0:00:00", and the display will be replaced by the Record mode display after 5 seconds.

[3] Press DISPLAY when you want to know the elapsed recording time.

For Tape Access





NOTES:

- Index codes cannot be marked or erased if the cassette's record tab is removed. ☞ p.8.
- Press ► (Play) or ■ (Stop) to cancel Index Search or Blank Search.
- If the end of the tape is reached during Index Search or Blank Search, the mode is cancelled and the tape is rewound to the beginning.
- When a fully recorded tape is used for re-recording new material, Blank Search can be used to detect the end of the new material.

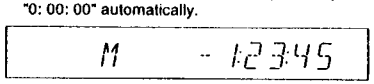
Counter Memory (Recorder)

During Play or Stop:

[1] Press COUNTER RESET (with a counter reading on the display) at a point you wish to locate later.
- The counter will read "0: 00: 00".

[2] Press COUNTER MEMORY.
- "M" will appear in front of the counter digits.

[3] Press REW (or FF) when you wish to return to that point.
- The tape will rewind (or fast forward) and stop at about "0: 00: 00" automatically.



[4] To cancel the Counter Memory mode, press COUNTER MEMORY.

Index Search (Remote Control)

This function gives you quick access to any one of 9 index codes in either direction. Your recorder automatically marks index codes at the beginning of each recording. You can manually mark and erase index codes as well.

During Playback or Stop:

[1] Press INDEX. "INDX 1" will be displayed.
- If you wish to access index codes 2 through 9, press INDEX repeatedly until the correct index number is displayed.

[2] Press ►► (Fast Forward) or ◄◄ (Rewind). Index Search will start in the corresponding direction.

Manual Index Mark/Erase (Remote Control)

TO MARK

During Playback or Record:

[1] Press MARK. The recorder will mark an index code at that location.

TO ERASE

During Playback or Still:

[1] Press ERASE. The recorder will fast-forward to the nearest index code and delete it.

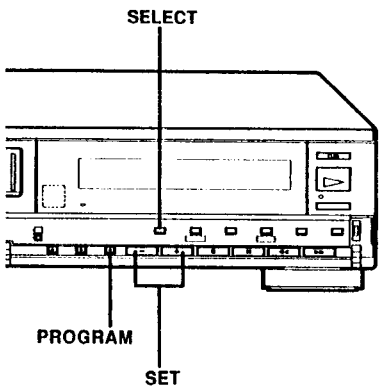
Blank Search (Remote Control)

This function lets you quickly locate the blank portion of a partially recorded tape.

During Stop:

[1] Press SKIP/BLANK.
- The recorder automatically fast-forwards or rewinds to the end of the recorded portion of tape, and stops.
- The tape's remaining time is automatically displayed. Press DISPLAY to return to the realtime counter display.

For Timer Recording



Things You Should Know

Timer-recording is one of the most useful functions of your video recorder, and, if you don't understand it, it can be one of the most complicated too. This chapter describes the method of programming the timer directly with the recorder's controls, and how the message display helps you in timer recording. Please read the following to get a clear idea about why things work the way they work, and what you should do when things don't work as expected.

Direct Timer Programming

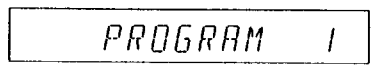
The built-in 1-year/8-event programmable timer can be set directly at the recorder, referring to the message display panel. Make sure that the message display panel shows the correct current time.

A TURN ON THE RECORDER

1 Insert a cassette with the record tab in place.
- The recorder power will come on automatically.

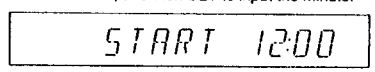
B ACCESS THE TIMER PROGRAM

2 Press PROGRAM.
- You are ready to input data into Program No. 1.
- To change the program number, press SET.



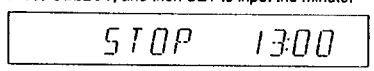
C INPUT THE START TIME

3 Press SELECT, and then SET to input the hour.
4 Press SELECT, and then SET to input the minute.



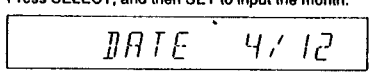
D INPUT THE STOP TIME

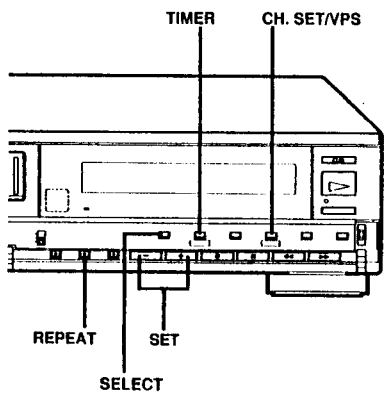
5 Press SELECT, and then SET to input the hour.
6 Press SELECT, and then SET to input the minute.



E INPUT THE DATE

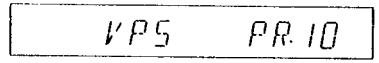
7 Press SELECT, and then SET to input the day.
8 Press SELECT, and then SET to input the month.





F INPUT THE CHANNEL NUMBER

9 Press SELECT, and then SET to input the channel.



- Normally, you should leave "VPS" on so you can take advantage of VPS recording*. You can cancel VPS by pressing the CH.SET/VPS button whenever the memory program is open. If you have any questions about VPS, ☞p.22.

G END ONE PROGRAM

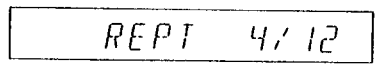
10 Press SELECT.
- The current program number will appear and blink.
- To make corrections, advance with SELECT to the item you wish to change and input new data with SET.
- If you need to set another program, press SET and repeat steps 3 through 10.

H SET TO TIMER MODE

11 Press TIMER.
- The recorder will enter the timer mode and power will go off.
- Press TIMER again to release the timer mode.

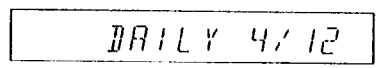
Variations in Step E (Weekly Program)

This function lets you set the recorder to timer-record at the same time on the same day every week. Use it to record weekly serials.
- First press REPEAT and then enter the date.



Variations in Step E (Daily Program)

This function lets you set the recorder to timer-record at the same time everyday. Use it to record daily serials.
- To record a daily serial starting on the day of setting, press REPEAT twice and then press SELECT until the display changes to channel setting mode.
- To record a daily serial starting on a certain day, press REPEAT twice and then enter the date.



NOTE:
The REPEAT button rotates the date set mode among DATE, REPT, and DAILY.

*VPS adapter is reqired on "E" version.

For Timer-Recording (cont'd)

Error Messages

The following error messages may appear on the message panel when you press the TIMER button to engage the Timer Standby mode. Here's why, and what you should do.

NO CASS

- Displayed for 5 seconds and the Timer Standby mode is cancelled.

WHY: There is no cassette in the recorder.
WHAT TO DO: Insert a cassette. Press TIMER again.

NO REC TAB

- Displayed for 5 seconds. The Timer Standby mode is cancelled.

WHY: The inserted cassette has its record tab removed.
WHAT TO DO: Eject that cassette. Insert a cassette with its record tab intact. Or cover the record tab hole of the cassette with adhesive tape and re-insert it. Press TIMER again. ☞p.8.

NO-PROGRAM

- Displayed for 5 seconds. The Timer Standby mode is cancelled.

WHY: There are no preset programs in memory.
WHAT TO DO: Check the programmed data and re-program it as necessary. Press TIMER again.

Other Messages

The following messages may also be encountered during timer-recording.

TIMER (with current hour)

WHY: The recorder is in the Timer Standby mode. This is the normal display you should see when you press the TIMER button.

TIMER REC

WHY: Normal display while timer-recording is in progress.

TAPE END

WHY: If this and "TIMER REC" are alternately displayed, it means that the end of the tape was reached while timer-recording was in progress. Therefore, the preset program may not be recorded in its entirety.

SET CLOCK

WHY: This means the clock must be set. It's displayed when time-keeping is terminated due to a power failure or because the recorder's power plug was pulled from the AC outlet.
WHAT TO DO: Set the clock. ☞p.9.

- If power was interrupted, it's also likely that all preset timer programming data has been erased. Please check and re-program as necessary.

The following messages may be encountered when the TRANS button of the remote control is pressed. ☞p.14.

PROGRAM (with number)

- Displayed for 2 seconds.

WHY: The transferred data has been stored in that program number. (The smallest vacant program number is always selected automatically.)

TRANS ERR

- Displayed for 5 seconds.

WHY: Data was not successfully transferred. The program may have been incorrectly preset, or the recorder's clock has not been set.
WHAT TO DO: Check the LCD program, and re-program as necessary. Transfer the correct data.

PROG FULL

- Displayed for 5 seconds.

WHY: All the recorder's timer programs (1 – 8) are preset.
WHAT TO DO: Cancel unnecessary programs, and transfer again.

On Checking And Cancelling Programs

Since executed programs are automatically cleared from memory (except those for daily and weekly serials), cases where the entire 8-event memory is full should be rare. If this should happen, check the preset programs and cancel one or more to make room for the new program(s) you wish to input.

TO CANCEL A PROGRAM

1. Press PROGRAM.
   - Program 1 is displayed with the number blinking.
2. Press SELECT to review the program contents in succession.
3. Press CANCEL to erase the program from memory.
   - You can press CANCEL at any stage while the program is open. .
   - To erase another program, press SET when a blinking program number is displayed.

NOTE:

PROGRAM and CANCEL buttons are also provided on the remote control (labelled VTR PROG. and VTR CANCEL). These operate the recorder directly. Do not confuse with the MEMORY PROG. and MEMORY CANCEL buttons which control the LCD timer programs.

Some Facts On Timer Operation

- If the end of the tape is reached during timer-recording, the cassette is automatically ejected and recorder's power is switched off with "TIMER REC" and "TAPE END" flashing alternately on the message display panel.
- When timer-recording is successfully completed, the recorder's power is automatically switched off.
- Since the timer starts and stops recording based on the time being kept by the recorder's built-in clock, the clock's time must be accurate for correct timer-recording results.

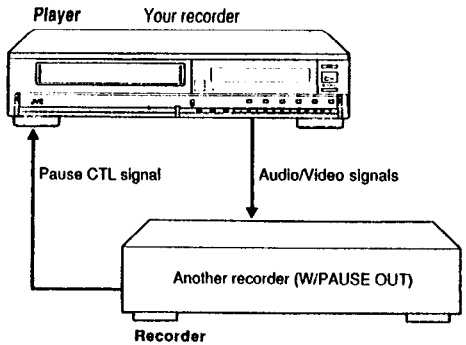
VPS Recording

Now available from some TV stations, VPS (Video Program System) is a service designed to assure safe, accurate timer-recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over times you preset in the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed. If your video recorder is an "EG" model, it already incorporates a built-in VPS decoder. If your recorder is an "E" model and you want to take advantage of this service (if available), you must connect an optional adapter (☞ Specifications) to the VPS/VPV/VPT connector on the rear panel of your recorder.

To Use VPS Service

- For each timer program, the initial setting is "VPS ON" and you will see "VPS" on the display panel together with a channel number. You do not have to cancel "VPS" even for non-VPS programmes, because those programmes will be recorded at the preset times.
- To cancel "VPS", press the VPS button. Pressing the VPS button alternates the setting, and "VPS ON" or "VPS OFF" is displayed for 2 seconds.
- When you open the LCD timer memory, the LCD display always shows "VPS". If your video recorder is an "E" version and you have not connected a VPS adapter, be sure to cancel "VPS" by pressing the VPS/CH button before transferring the memory data to the recorder.

For Editing



Editing To/From Another Recorder

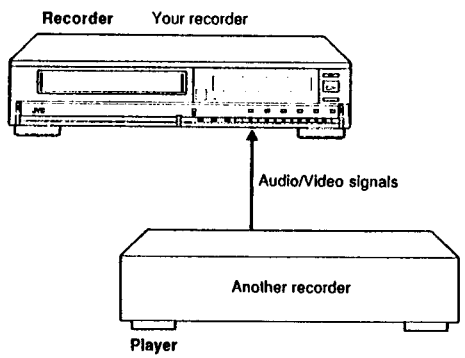
Your video recorder can be used as either the recording deck or the source player when editing tapes. When used as the source player in combination with another video deck which is preroll-capable and equipped with a Pause Control Output terminal, your recorder's PAUSE terminal can accept preroll commands for synchronized preroll editing.

PREPARATION

1. Connect the player's AUDIO/VIDEO connector to the recorder's AUDIO/VIDEO connector.

OPERATION

2. Set the recorder to external input mode (AUX).
   - Press numeric key "0", or press TV PROGRAM until "AUX INPUT" appears in the channel display section.
3. Put the player in the Play mode.
4. Put the recorder in the Record mode.

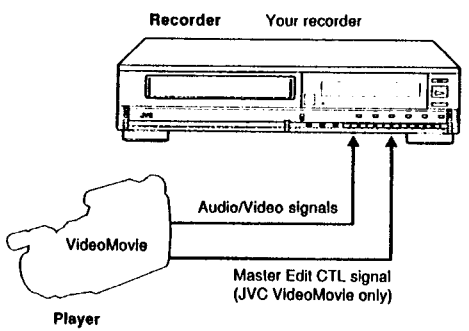


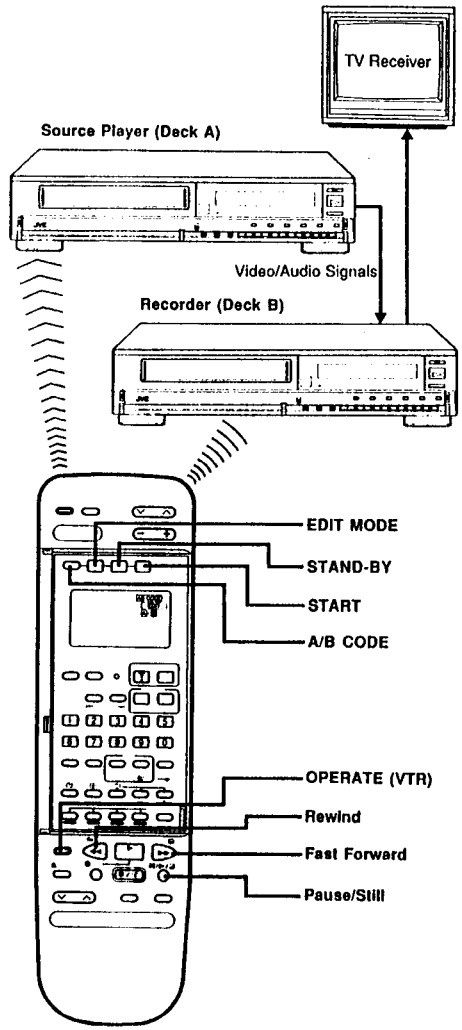
Editing From A VideoMovie

Tape-to-tape editing is also possible using a VideoMovie (equipped with playback facility) as the player and your recorder as the recording deck. In this case, the recorder's PAUSE terminal can be used to accept Master Edit Control commands from the VideoMovie.

PREPARATION

1. Connect the VideoMovie's AV OUT connector to the recorder's AUDIO/VIDEO connector.
2. Connect the AV output cable's mini-plug to the PAUSE terminal of the recorder.
   - If the VideoMovie is equipped with the Master Edit Control system, you can control the recorder using the VideoMovie's controls. See VideoMovie's instruction manual for operating procedures.
   - With this connection, you can also use the VideoMovie as a video camera for direct recording onto the recorder's tape. Put the recorder in Record-Pause and use the VideoMovie's start/stop trigger to start and pause recording. (For direct recording with a separate video camera, a camera adapter is necessary.)





CAUTION:
Some TV sets may malfunction in response to the B mode. If this happens switch back to the A mode.

Duet Editing

For those who have two JVC video recorders and are interested in editing, this function will simplify editing operations by delivering separate commands to two recorders simultaneously from a single remote control in the form of separate "A" and "B" control codes. (Designated JVC models only.)

PREPARATION

1. Connect two JVC recorders. (PAUSE connection not necessary.) ☞p.23.
2. Set one recorder to respond to A code signals (deck A), and the other to respond to B code signals (deck B). ☞"A/B Code Switching"
3. Place the two decks side by side.
4. Load a recorded tape into deck A, and a blank tape into deck B.

OPERATION

5. Press the EDIT MODE button. ("EDIT" and "A → B" will appear on the LCD.)
   - If you are using deck B as player, and deck A as recorder, press the A/B CODE button. "A → B" will be replaced with "B → A".
6. Press STAND-BY. Deck A enters Still mode, deck B enters Record-Pause mode.
7. Search for a scene you want to edit from deck A to deck B (only the tape in deck A will move) and press II/I► (Pause/Still).
8. Press START. Deck A enters Play mode, B enters Record mode.
9. Press II/I►. Deck A enters Still mode, B enters Record-Pause mode.
   - Repeat steps 7, 8, and 9 to continue editing.
10. Press EDIT MODE to cancel the Duet Edit mode.

A/B Code Switching

The remote control is preset to send A code signals (indicated by "A CODE" on the LCD) because your video recorder is initially set to respond to A code signals. You can easily modify your video recorder to respond to B code signals.

1. Unplug the recorder's power cord from the AC outlet.
2. Press the A/B CODE button. ("B CODE" will appear on the LCD.)
3. Plug the power cord back into the AC outlet. Do not use other remote controls at this stage.
4. Turn the recorder power on using the remote control's OPERATE (VTR) button. The recorder will now only respond to B code signals.

NOTE:

You can operate two recorders (A and B) independently from your remote control. Except in the Duet Edit mode, it will send either A or B code signals only, selected with the A/B CODE button.

Special Operations

Setting The Recorder's Clock Directly

To set the recorder's clock, all you have to do is transfer the LCD clock data again (☞p.9). If you prefer to set or adjust the recorder's clock directly at the recorder, read on.

1. Press PROGRAM/CLOCK ADJ.
   - If you are only adjusting the time, the Timer Program mode will be engaged first. So press PROGRAM/CLOCK ADJ. again.
2. Press SET (+ or –) to input the hour.
3. Press SELECT, and then SET (+ or –) to input the minute.
   - If you are only adjusting the time, skip steps 4 – 6.
4. Press SELECT, then SET to input the day.
5. Press SELECT, then SET to input the month.
6. Press SELECT, then SET to input the year.
7. Press PROGRAM/CLOCK ADJ.

NOTES:

- If the day and month data is invalid (such as 31st April), the month digits are cleared automatically and the day digits will blink. Input again.
- If the year digits are automatically cleared when the PROGRAM/CLOCK ADJ. button is pressed in step 7, it is possible that you have input 29th February for a non-leap year. The day digits will blink. Input again.

Setting The Clock Forward Or Backward By One Hour (Daylight Saving Time Adjustment)

This adjustment can be done independently for the LCD clock and the recorder's clock.

TO ADVANCE THE TIME BY ONE HOUR

- Press SUMMER TIME ADJ. (ADJUST) and quickly release.

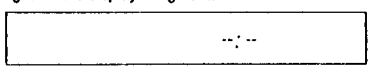
TO SET THE TIME BACK BY ONE HOUR

- Keep SUMMER TIME ADJ. (ADJUST) pressed for more than 2 seconds.

Turning Off The Display

The fluorescent display on your JVC recorder can be switched off at any time.

1. Press the DISPLAY OFF button on the recorder. The lights in the display will go out.

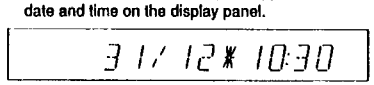


2. To restore the display, press the DISPLAY OFF button again.

Locking The Recorder's Controls

To avoid unwanted operation and prevent accidental recording or other interference, use the Child Lock function.

1. Press the remote control's OPERATE (VTR) button to turn the recorder's power off. Keep this button pressed for about 2 more seconds after the power LED indicator has gone off.
   - The Child Lock indicator (🔒) will appear between the date and time on the display panel.



2. Child Lock is automatically deactivated when you switch the recorder's power on again with the remote's OPERATE (VTR) button.
   - Pressing the TIMER button during timer-recording also deactivates the Child Lock mode.

NOTES:

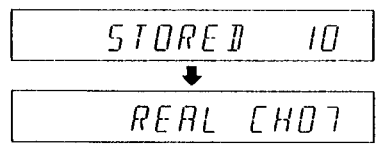
- While the Child Lock mode is engaged, make sure you keep your remote control in a safe place inaccessible to children.
- Timer-recording is possible in the Child Lock mode. After timer-recording has been performed, the Child Lock mode remains in effect.

Changing Preset Channels

TO CHECK STORED REAL CHANNELS

This is possible both at the recorder and with the remote control. First turn on the recorder.

1. Press TV PROGRAM to select the channel position of the stored real channel whose number you want to know. (e.g. PR. 10)
2. Press CH SET.

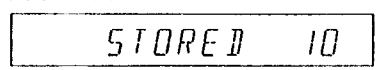


   - This indicates that channel position 10 stores real channel 7.
3. To check other channel positions, press TV PROGRAM.
   - Either "STORED xx" or "SKIPPED xx" will appear, followed by "REAL CH xx" or "REAL CC xx".
4. The Channel Set mode will be cancelled in about 10 seconds unless you call up another channel position: Do not press the CH SET button; this alternates between CH and CC bands.

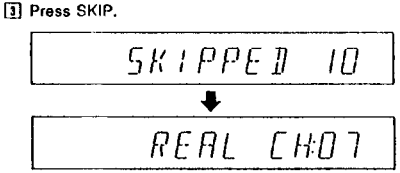
TO DELETE STORED CHANNELS

Use the recorder's controls. First turn on the recorder.

1. Press TV PROGRAM to select the channel position you want to skip. (e.g. PR. 10)
2. Press CH SET.



3. Press SKIP.

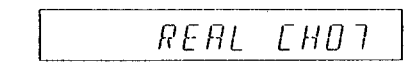


   - This indicates that real channel 7 has been deleted from channel position 10.

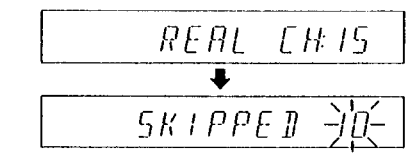
TO STORE NEW CHANNELS

Use the remote control since its 10 numeric keys can access real channels and channel positions directly. (Using the recorder's auto SEARCH button will clear all preset channels.) First turn on the recorder.

1. Press VPS/CH.



2. Press VPS/CH again and keep it pressed until the real channel number starts blinking.
3. Press VPS/CH to change the band between CH and CC, if necessary.
4. Press numeric keys to input the number of the real channel you want to store. (e.g. CH 15.)



5. Press numeric keys to input the number of a vacant channel position (e.g. 20), and hold the key for the 2nd entry until the display changes to "STORED 20".

   - The Channel Set mode will be cancelled automatically after about 10 seconds.

ATTENTION

The "real channel" numbers displayed on the recorder may not correspond to channel designations in your area.

ITALY

Display	CH	13	14	15	16	17	18	19	20	11	12
Corresponding channel		A	B	C	D	E	F	G	H	H1	H2

BELGIUM

Display	CC	01	02 10	11 20
Corresponding channels		80(M1)	81(M2) ... 89(M10)	90(U1) ... 99(U10)

SWITZERLAND

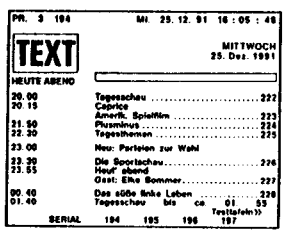
Display	CC	75	76	77
Corresponding channel		X	Y	Z

Using The Optional Teletext Adapter

Teletext services have established themselves as one of the most flexible sources of information and broadcast schedules available to TV and video users. Your video recorder is ready to take full advantage of these services. By connecting an optional teletext adapter (☞ Specifications), you'll not only be able to view the vast number of teletext pages now available, you'll be able to transfer broadcast schedule data directly to your recorder's timer for instant, automatic timer programming. You'll also be able to make full use of your remote control's capabilities, with all the dual or triple function controls working as intended. Here are just a few examples of features available to you when you connect an optional teletext adapter.

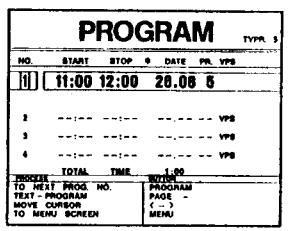
TELETEXT

- View broadcast teletext pages.
- Several page access modes are available for quick, convenient location of pages you want to see.
- You can program the video recorder's timer directly using TV schedule pages.



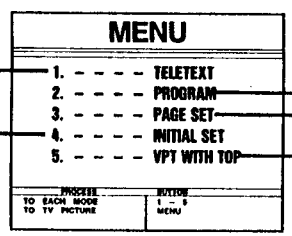
PROGRAM

- Check timer recording data on the colour on-screen display.
- Program the timer manually with the remote's numeric keys.



PAGE SET

- You can preset favourite or often-referred-to pages for immediate access.
- Up to four pages can be stored on each of the numeric keys, for a total of 40 pages.



VPT WITH TOP

- TOP automatic teletext timer programming.
- Convenient colour-coded page access.

"5.- - - - VPT WITH TOP" only appears when the video recorder's tuner is tuned to a station transmitting TOP broadcasts. (Applicable only in certain areas.)

INITIAL SET

LANGUAGE

- Select one of four languages (English, German, Italian, or Swedish) for on-screen messages.

CLOCK ADJUST

- Set the recorder's clock manually using the numeric keys.
- Set the recorder's clock automatically by reading teletext time information.

ATTENTION

Some buttons on the remote control unit are labelled with pictograms indicating the functions that can be used when the VPT adapter is connected. When reading the VPT adapter's instruction manual, keep in mind the correspondence between these pictograms and the labels referred to in the instruction manual:

⊕ : LARGE/NORMAL
? : REVEAL
⊕ : HOLD
◪ : MIX
→ : ROTATE
⊕ : RESET

Full List Of Display Panel Messages

Displayed Message	When It Appears, What It Means
During Clock Set	
12:59	"12:59" is input for the time.
30/11/91	"30th November, 1991" is input for the date.
During Program Set	
PROGRAM 1	"Program 1" has been opened/ set/cancelled/successfully transferred.
DATE 31/12	"31st December" is input for the recording start date.
REPT 31/12	"Repeat" command is input for recording of a weekly serial.
DAILY 31/12	"Daily" command is input for recording of a daily serial.
START 11:00	"11:00" is input for the recording start time.
STOP 12:30	"12:30" is input for the recording stop time.
VPS PR. 10	"10" is input as the channel to be recorded, with VPS ON.
VPS ON	"VPS" status is changed from OFF to ON. Displayed for 2 seconds.
VPS OFF	"VPS" status is changed from ON to OFF. Displayed for 2 seconds.
During Channel Set	
REAL CH 02	"Real Channel 02 in CH band" is scanned.
REAL CC 02	"Real Channel 02 in CC band" is scanned.
REAL CH :15	"Real Channel 15 in CH band" is received, but not stored.
SKIPPED	Channel position "10" is currently called up, and ready for input.
STORED 10	Received real channel has been stored in channel position "10".
FINE - CH 15	"Fine tuning" is engaged for "Real Channel 15 in CH band"
During Normal Operation	
PLAY	Normal playback is in progress.
STOP	Stop mode has been engaged. Displayed for 2 seconds.
STILL	A still picture is being viewed.
FF	Fast-forwarding.
REW	Rewinding.
REC 10	Recording "Channel 10".
REC AUX	Recording "External Input".
REC 1:30	Recording with the Off Timer set to shut off in 1 hour 30 minutes.
PAUSE 10	Recording is paused.
TIMER REC	Timer-recording is in progress.
FWD SLOW	Slow motion playback is in progress.
FWD SEARCH	Forward search is in progress.
REV SEARCH	Reverse search is in progress.
SKIP	Skip Search is in progress.
BLANK	Blank Search is in progress.
INDX + 9	Searching for the 9th index code in the forward direction.
INDX – 4	Searching for the 4th index code in the reverse direction.
INDX MARK	Index code is being marked.
INDX ERASE	Index code is being erased.
REPEAT	Repeat playback is in progress.
PR. 10	Channel 10 is being received.
VPS PR.10	A VPS programme is being received on channel 10.
AUX INPUT	Auxiliary input source is being received.
EJECT	Cassette is being ejected.

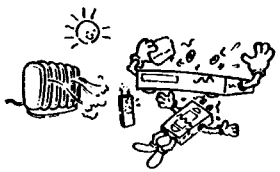
Displayed Message	When It Appears, What It Means
During Next Function Memory	
REW – OFF	Will rewind to the beginning and then shut off automatically.
REW – PLAY	Will rewind to the beginning and then start playback automatically.
REW – TIMER	Will rewind to the beginning and then enter the timer mode automatically.
REW – EJECT	Will rewind to the beginning and then eject the tape automatically.
Clock and Counter Displays	
4:30:15	Tape counter reading of "4 hours, 30 minutes, 15 seconds".
M 4:30:15	Same as above with Counter Memory ON.
REMAIN 2:24	2 hours and 24 minutes of recording time remaining on the tape.
31/12 10:30	It is 31st December, 10:30. (Standard date/time display when recorder power is turned off)
31/12 10:30	Same as above with Child Lock ON.
TIMER 10:30	It is 10:30 and the Timer Standby mode is engaged.
SET CLOCK	The clock is not set. Please set it.
SET CLOCK	Same as above with Child Lock ON.
TIMER REC / TAPE END	End of tape was reached during timer-recording.
-:-	Display is turned OFF.
Error Messages	
NO CASS	There is no cassette in the recorder.
NO REC TAB	The cassette's record tab is removed.
NO-PROGRAM	No program has been preset.
TRANS ERR	Transfer is rejected due to wrong data.
PROG FULL	Transfer is rejected due to no vacant programs.
Other Messages	
GOOD MORNING / GOOD AFTERNOON / GOOD EVENING	Automatic greetings when the recorder is turned on.
GOOD-BYE GOOD NIGHT	Automatic greetings when the recorder is turned off.

NOTES:

This list represents the various types of messages your recorder is capable of generating. Actual messages displayed by your recorder (esp. if date, time, channel, tape counter reading, or other variables are involved) will differ slightly from those listed here.

Precautions

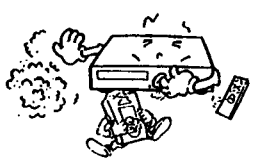
Recorder, Remote Control, And Cassette Care



Avoid extreme heat and direct sunlight

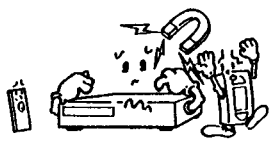
Avoid extreme cold

Avoid extreme humidity



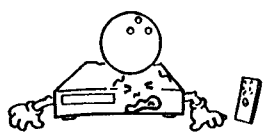
Avoid dust

Avoid places subject to vibrations



Avoid strong magnetic fields

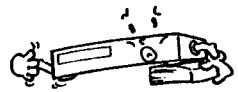
Do not block the recorder's ventilation openings



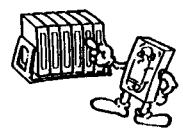
Do not place anything heavy on the recorder or remote control

Do not place anything which might spill on top of the recorder or remote control

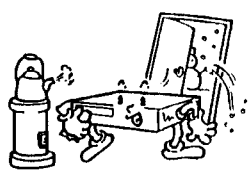
Do not place the recorder on cushions, pillows, or thick carpeting



Use the recorder in a stable, horizontal position only

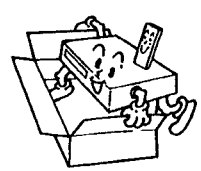


Place cassettes in cassette cases and store vertically



Beware of moisture condensation

Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions — just as water droplets form on the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the recorder's power turned on for a few hours to let the moisture dry.



When transporting

- Be sure to remove cassette from recorder before packing
- Avoid violent shocks to the recorder during packing and transport

Special Note On Head Cleaning

Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Although this model is equipped with a built-in head cleaner which automatically cleans the heads, reducing the likelihood of dirty heads, if such troubles are encountered please consult the nearest JVC dealer.

In Case Of Difficulties

POWER AND TAPE TRANSPORT PROBLEMS

Symptoms	Check points
No power is applied to the recorder.	• Is the power cord disconnected? — Connect it.
Clock is functioning properly, but the recorder cannot be powered.	• Is "TIMER" displayed on the display panel? — Press the TIMER button to extinguish the display.
Tape does not run during recording.	• Is "PAUSE" displayed on the display panel? — Press the PLAY button to extinguish the display.
Tape stops during rewind or fast-forward.	• Is the COUNTER MEMORY button pressed? — Press again to make "M" disappear from the display panel.
Tape will not rewind or fast-forward.	• Is the tape already fully rewound or fast-forwarded? — Check the cassette.

RECORDING PROBLEMS

Symptoms	Check points
Recording cannot be started.	• Is a cassette loaded? • Is the record tab on the cassette removed? — Reseal the slot with adhesive tape.
TV broadcasts cannot be recorded.	• Has "AUX" been selected? — Set to the desired channel.
Tape-to-tape editing is not possible.	• Is the VideoMovie or another video recorder correctly connected? • Are all necessary power switches turned ON? • Has "AUX" been selected? — Set to "AUX".
Camera recording is not possible.	• Is the VideoMovie correctly connected? • Has "AUX" been selected? — Set to "AUX".
Timer recording is not possible.	• Have you set the clock correctly and programmed the timer correctly? — Check once again. • Is "TIMER" displayed on the display panel? — If not, press the TIMER button to display "TIMER".

PLAYBACK PROBLEMS

Symptoms	Check points
Playback picture does not appear while the tape is running.	• If you are using RF OUT connection, is the TV receiver's channel selector set to the correct video channel? — Set it to the RF converter channel (UHF 36). (☞p.7) • If you are using AV connection, is the TV receiver set to the AV mode? — Set it to the AV mode.
Playback is repeated.	• Is the REPEAT switch set to either FULL or INDEX? — Set it to OFF.
Noise appears during visual search.	• This is normal.
Noise appears during normal playback.	• Is the automatic tracking mode engaged? — Try manual tracking. (☞p.16)
Noise appears during slow motion playback.	— Try manual tracking. (☞p.16)
Noise appears during still playback.	— Press Pause/Still a few times to remove the noise bars from the screen.
Playback picture is blurred or interrupted while TV broadcasts are clear.	• Video heads may be dirty. — Head cloaning is necessary. Consult your JVC dealer. (☞p.30)

OTHERS

Symptoms	Check points
Whistling or howling is heard from TV during camera recording.	• Move VideoMovie or camera's microphone away from TV or reduce TV sound volume.
Clock setting is not possible.	• Is "TIMER" displayed on the display panel? — Press the TIMER button to extinguish the display.
Some channels are skipped over when scanning channels.	• Those channels are preset to be skipped over. If you need them, restore them. (☞p.26)
Channel cannot be switched.	• Is recording in progress? — Press the PAUSE/STILL button, change the channel, and press the PLAY button.
Remote control does not function.	• Are the batteries discharged? — Replace with new ones. • Is the A/B CODE indicator showing the proper code for the recorder being operated? — Press the A/B CODE button for the correct setting.
Index Search does not function properly.	• Adjacent index codes may be too close to each other. — Erase some index codes and mark new ones if necessary, with sufficient distance between any two index codes.

ATTENTION:

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

SECTION 1
DISASSEMBLY AND MECHANISM ADJUSTMENTS

1.1 DISASSEMBLY

1.1.1 Top cover

1. Refer to Fig. 1-1-1 and set for the EJECT (Stop) mode and disconnect VCR from AC power.
2. Take out 4 screws (A) and 1 screw (B). To remove the top cover, slide it in the direction of the arrow and lift it away.

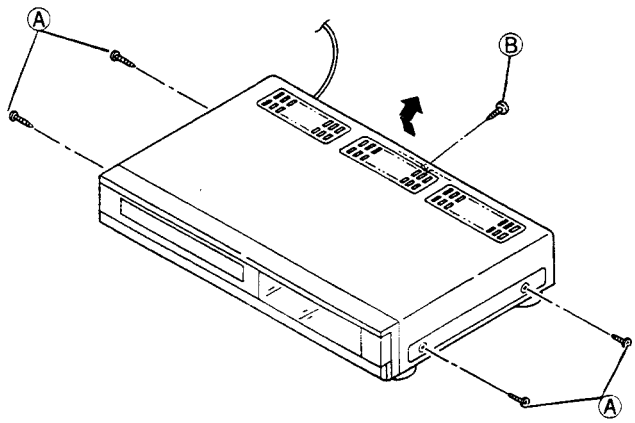


Fig. 1-1-1

1.1.2 Front panel assembly

1. Remove the top cover.
2. Carefully disengage 3 tabs (C) of the front panel assembly from the upper side of the chassis.
3. Refer to Fig. 1-1-2 and pull the front panel assembly forward you to disengage 3 tabs (D) of the front panel assembly from the bottom side of the chassis, then remove the front panel assembly.

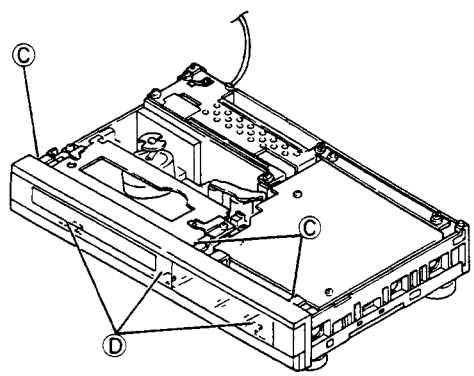


Fig. 1-1-2

1.1.3 Bottom cover

1. Remove the top cover.
2. Refer to Fig. 1-1-3 and take out 4 screws (E) and 1 screw (F) from the bottom of the chassis.
3. Disengage 4 claws (G) from the bottom of the chassis, and disengage the bottom cover from the bottom of chassis.

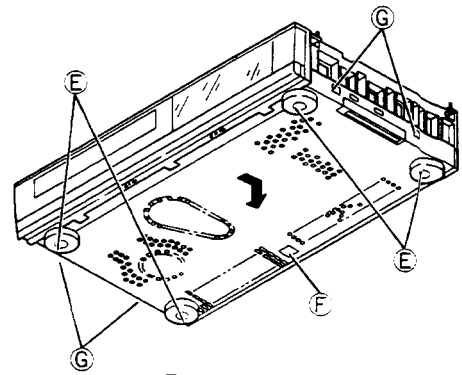


Fig. 1-1-3

1.1.4 Main board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-4 and take out 5 screws (H) from main board assembly.
3. Take out 1 screw (I) from terminal board, and remove the main board assembly in the upward direction.

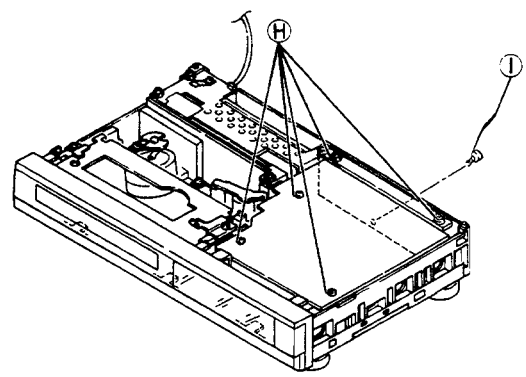


Fig. 1-1-4

1.1.5 Cassette housing

1. Remove the top cover and main board assembly.
2. Refer to Figs. 1-1-5 and 1-1-6.
   Take out 4 screws (J) that secure the cassette housing. Disengage 3 tabs (K) of the front panel and pull the front panel forward where it does not interfere with removing the cassette housing.
3. Remove the cassette housing in the upward direction.

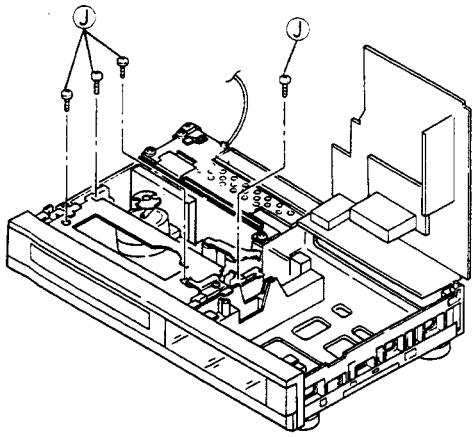


Fig. 1-1-5

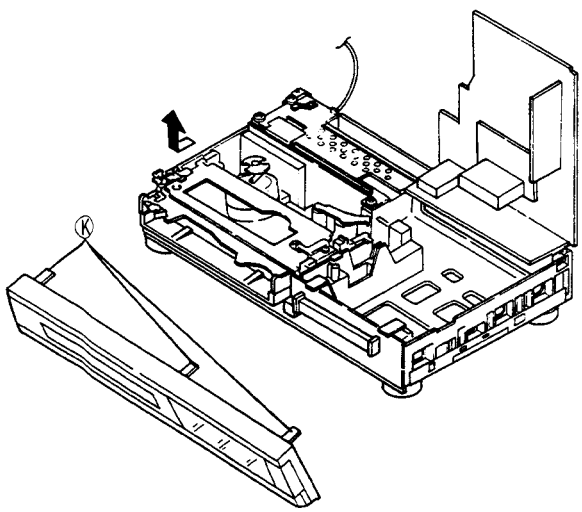


Fig. 1-1-6

1.1.6 Cassette housing installation

1. On the main deck, observe the positional relationships of the parts indicated in Fig. 1-1-7.
   If necessary, turn the loading motor by hand to obtain these positions.

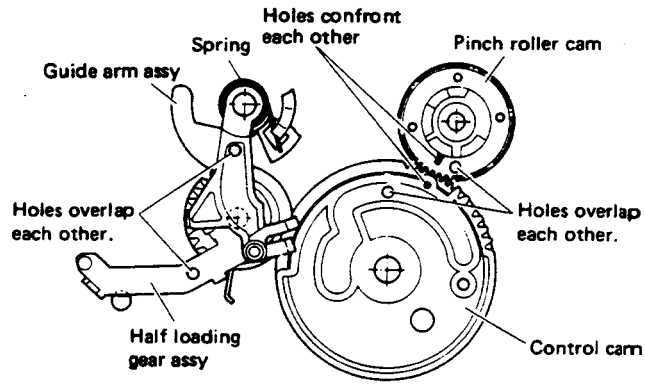


Fig. 1-1-7

2. Refer to Fig. 1-1-8 and confirm that the clutch is engaged.
   If necessary, press the lever indicated by the arrow to where the clutch is locked.

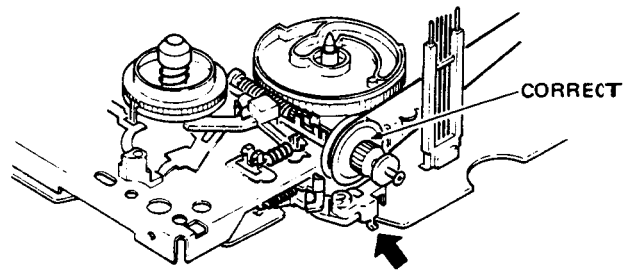


Fig. 1-1-8

3. Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position).
   Set the cassette housing into place and secure with 4 screws.
4. Install the front panel as shown in Fig. 1-1-9 and re-engage the tabs. Supply power and use a spare cassette to check for normal loading and eject operations.

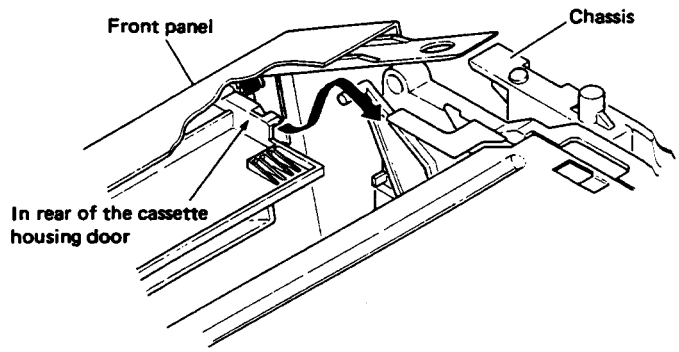
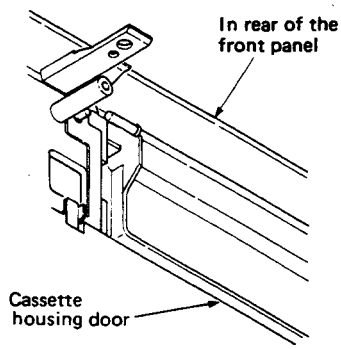


Fig. 1-1-9

5. Disconnect VCR from power, then reinstall the main board assembly and top cover.

1.1.7 Cassette housing door

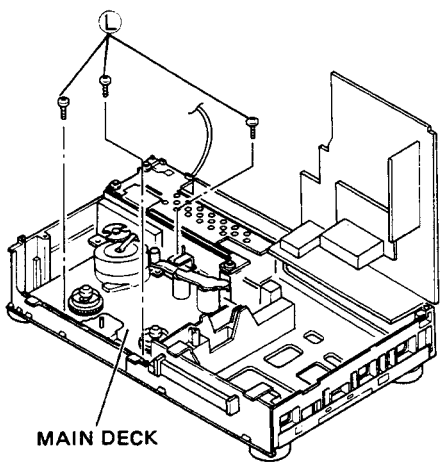
1. Remove the top cover and front panel assembly.
2. Refer to Fig. 1-1-10, with a lift of cassette housing door by hand, bend center of the cassette housing door toward you, then pull out the left end from the cassette housing.
3. Refer to Fig. 1-1-10 and use care regarding the torsion spring, then pull out the right end of the cassette housing door to move it.



Fgi. 1-1-10

1.1.8 Main-deck

1. Remove the top cover, front panel assembly and main board assembly.
2. Refer to Fig. 1-1-11 and take out 3 screws Ⓛ from the main-deck assembly.
3. Remove the main-deck assembly in the upward direction and disconnect a connector CN1 from the DECK TERMINAL board, connectors CN1, CN2 from the Pre/Rec board, connector CN1 from the A/C head board, connector CN1 from the Loading MDA board and connector CN1 from the Drum MDA board.



1.1.9 Switching regulator board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-12 and take out 4 screws Ⓜ from the switching regulator board assembly.
3. Remove the switching regulator board assembly in the upward direction.

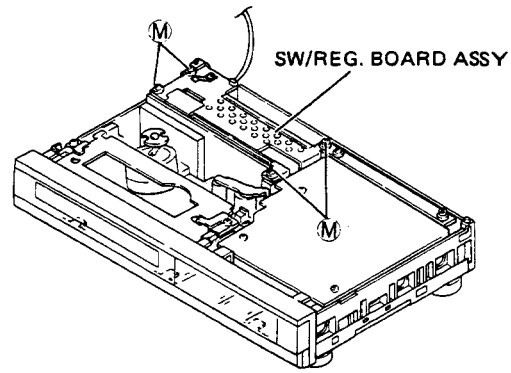


Fig. 1-1-12

1.2 MECHANISM ADJUSTMENTS

1.2.1 Precautions

1. Disconnect mainframe from AC power before soldering.
2. Avoid imparting stress to wires when disengaging connectors.
3. Determine and correct the cause of difficulty before proceeding to adjustments. Do not disturb settings unnecessarily.
4. Use care not to damage tabs, claws, etc. during repairs.
5. Install the cassette housing assembly only when the mechanism is in the Eject or Stop mode position. In the Eject mode, the internal holder of the housing is fully raised. This is fully lowered in the Stop mode.
6. When installing the front panel assembly, be sure to engage the housing door with the door lever of the cassette housing assembly. If this is omitted, the door will not open at Eject and the cassette cannot be removed.

1.2.2 Check without cassette housing

Mechanism operations can be observed easily by removing the cassette housing assembly. Note the following.

1. Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
2. Connect pins 2 and 3 of Main board connector CN601.
3. Select the desired modes with the operation buttons. However, notice that without tape, setting for the reverse direction modes produces the Stop mode after a few seconds due to absence of the reel sensor output.

1.2.3 Manually removing cassette tape

In event of electrical system failure that prevents the tape from being unloaded, the tape can be removed manually by the following procedure. Refer to Figs. 1-3-1, 1-3-2 and 1-3-3.

1. Disconnect power cord from AC outlet.
2. Turn the loading motor by hand so that the control cam rotates clockwise. This retracts the pole base assembly to the unloading position.
3. Continue turning to where the guide arm and half loading gear assemblies shift to beneath the cassette.
4. Turn the clutch assembly (capstan motot) at the rear of the deck to absorb slack tape within the cassette.
5. Again turn the loading motor in the same direction to raise the cassette and remove it.

1.2.4 Test equipment

The following special tools and fixtures are required for mechanism adjustment.

1. Alignment tape : MH-2
   Stairstep signal is employed for interchangeability checks and adjustments.
2. Torque gauge : PUJ48075-2
   Measures tape take-up torque.
3. Back tension cassette gauge : PUJ48076-2
   Measures tape tension at the supply side.
4. A/C head positioning tool : PUJ47351-2
   Shifts the head base for adjusting the control head position.
5. Roller driver : PTU94002
   Turns the guide roller for adjusting FM linearity.

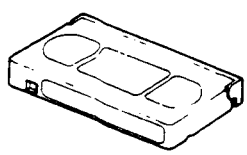
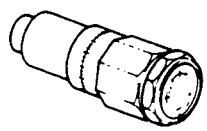
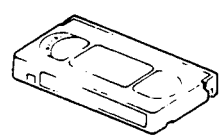
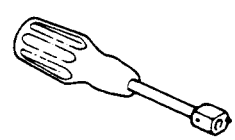
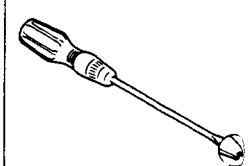
Alignment tapes 1	Torque gauge 2	Back tension cassette gauge 3	A/C head positioning tool 4	Roller driver 5
				

Fig. 1-2-4 Test equipment

1.3 MAIN MECHANISM PARTS

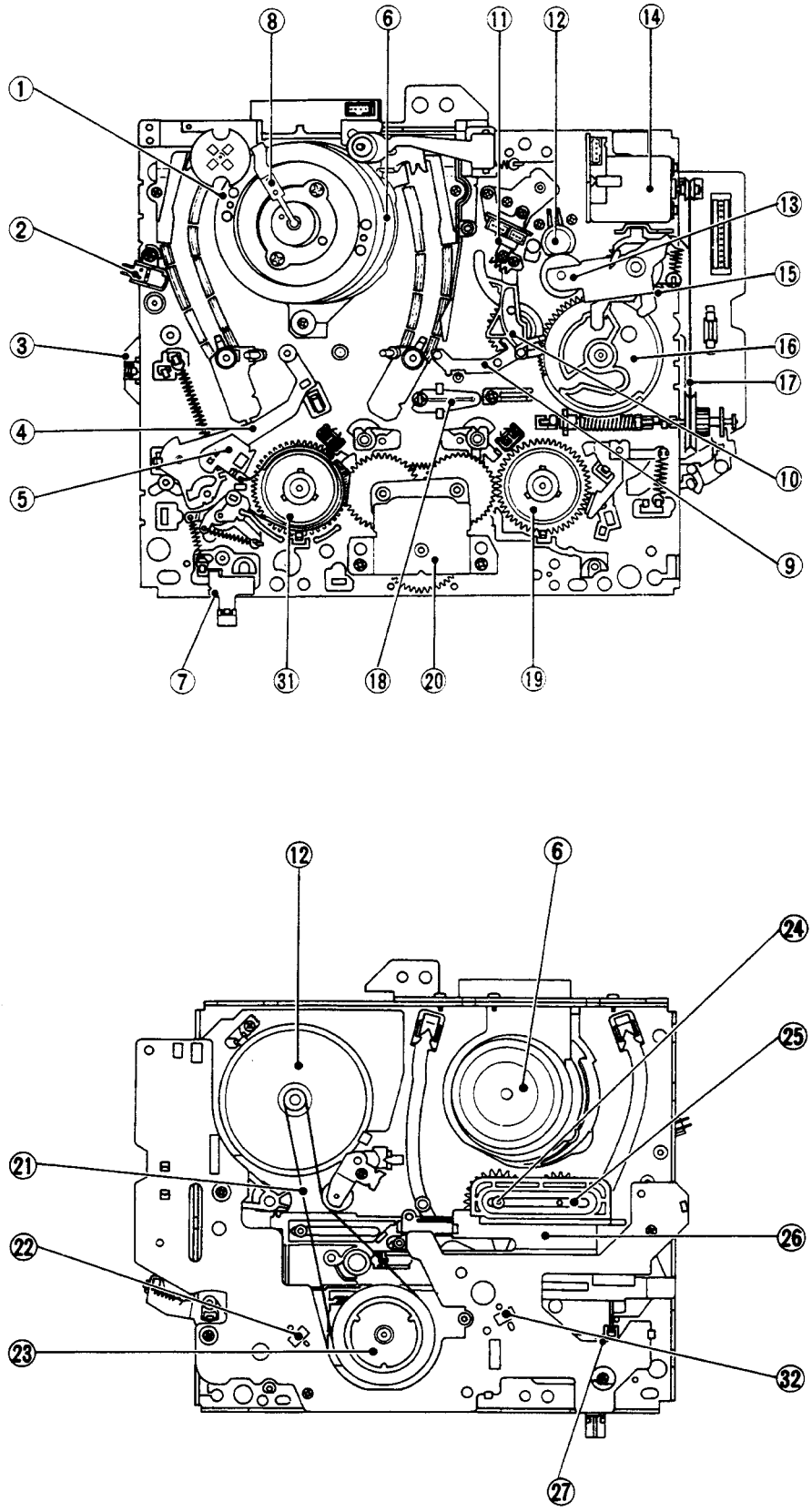


Fig. 1-3-2 Bottom view of main-deck

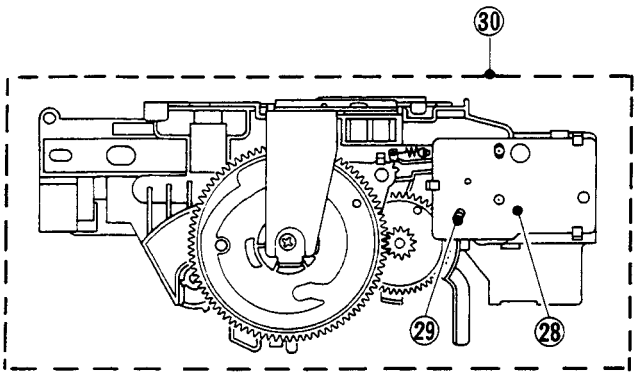


Fig. 1-3-3 Side view of cassette housing

A. Cleaning

Periodic cleaning of the tape transport system is desirable, but ordinarily not feasible in practice. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brushes can detract from playback picture quality and in extreme cases, even damage the tape. For cleaning, use a fine-mesh cotton cloth (about the texture of a white dress-shirt) moistened in alcohol.

- To clean the video heads, press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
- Do not use a vertical stroke, as this may damage the heads.

B. Lubrication

Oil and grease do not normally require periodic replenshing. Apply only when replacing lubricated parts (also clean and replace lubrication of mating parts if soiled).

For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly.

Before oiling, clean with alcohol.
Apply one or two drops of oil. Avoid excess oil.

1. Table 1-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part No.
Oil	COSMO-HV56
Grease	KANTO-G-31KAV

Table 1-1

2. Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

Note: *Stir grease that has been stored for an extended period.*

C. Main mechanical parts

See Fig.s 1-3-1, 1-3-2 and 1-3-3.

No.	Symbol	Parts Name	See Section
1	M32A	Upper drum assy	1.5.1
2	M44	Full erase head	
3	51Q1	End sensor	
4	M41	Tension arm assy	1.5.4
5	M42	Tension band assy	1.5.4
6	M32C	Lower drum motor assy	1.5.2
7	M461	REC safety switch	
8	M32D	Brush assy	
9	M449	Half loading gear assy	1.5.5
10	M447	Guide arm assy	1.5.5
11	M48	A/C head	1.5.3
12	M422	Capstan motor	
13	M442	Pinch roller arm assy	
14	M434	Loading (Mode) motor assy	
15	M446	Pinch roller cam	1.5.5
16	M438	Control cam	1.5.5
17	M437	Loading belt	
18	M460	LED holder	
19	M430	Reel disk (take-up)	
20	M424	Idler gear unit	
21	M429	Timing belt	
22	51PS1	Take up reel sensor	
23	M426	Clutch unit	1.5.6
24	M433	Take up loading arm assy	1.5.7
25	M432	Supply loading arm assy	1.5.7
26	M439	Plate assy	1.5.7
27	M462	Slide encorder (S3)	
28	56PHS3	Cassette sensor	
29	56Q2	Start sensor	
30	M36	Cassette housing assy	
31	M470	Reel disk (supply)	
32	51PS2	Supply reel sensor	

- Symbol interpretation example

M32A: M = Exploded view symbol, 32A = Ref. No.
56 Q2: 56 = Board No., Q2 = Ref. No.

1.4 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage. Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced at when required.

1.4.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary.

Also note that rubber parts may deform in time, even if the set is not used.

System	No.	Parts Name	Symbol No.	Periodic servicing schedule (operation hours)								
				250	500	750	1000	1250	1500	1750	2000	Overhaul
Tape Transport	1	Upper drum	M32A	★	★	☆	○	○	○	○	○	●
	11	A/C head	M48	★	★	★	○	○	○	○	○	●
	13	Pinch roller	M442	★	★	★	○	○	○	○	○	●
	2	Full erase head	M44	★	★	★	○	○	○	○	○	●
	4	Tension arm	M41									●
	6	Lower drum	M32C				○	○	○	○	○	●
	12	Capstan (shaft)	M422	★	★	★	★	★	★	★	★	●
	9	Half loading gear	M449									●
	10	Guide arm	M447									●
Drive	12	Capstan motor	M422				○	○	○	○	○	●
	17	Loading Belt	M437				○	○	○	○	○	●
	21	Reel Belt	M424				○	○	○	○	○	●
	19	Take-up reel disk	M430				○	○	○	○	○	●
	31	Supply reel disk	M470				○	○	○	○	○	●
	23	Clutch assy	M426								○	●
	14	Loading motor	M434				○	○	○	○	○	●
		Worm clutch assy	M436								△	●
	26	Plate assy	M439								△	●
Others	5	Tension band	M42				○				○	●
	8	Brush	M32D				○				○	●

★ : Cleaning
☆ : Cleaning (or Replacement if necessary)
△ : Lubrication
No: Refer to Main mechanical parts

▲ : Lubrication (or Replacement if necessary)
● : Replacement
○ : Inspection or Replacement if necessary

Table 1-4-1 Approximate maintenance schedule

1.5 MAIN PARTS REMOVAL AND REPLACEMENT

No.	Item	Checkpoints	Adjustment and Checks
1	Upper drum assembly •Symptoms: FM signal absent, intermittent or weak on one channel; large difference in channel output levels •Cause: Worn or damaged video heads, poor response, etc.		

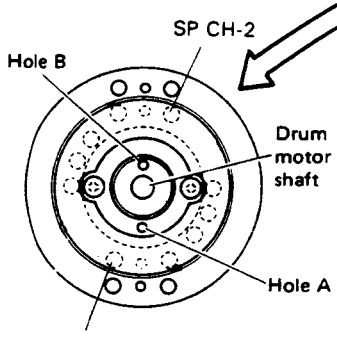


Fig. 1-5-1
DRUM TOP VIEW

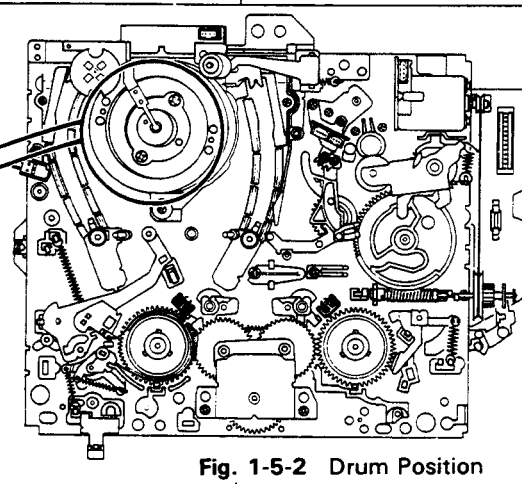


Fig. 1-5-2 Drum Position

Mounting direction See Fig. 1-5-1. (Symptom: no picture)	After replacing, observe that upper drum hole A is opposite the motor axis from lower drum hole B.
Axis wobble See Fig. 1-5-2. (Symptom: jitter, poor FM linearity) **PB FM: Main board TP206** **DRUM FF: Main board TP411**	Record and playback in SP mode. Confirm absence of large difference between channels. (Fig. 1-5-3)

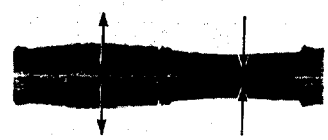


Fig. 1-5-3 Axis wobble

FM linearity check
See Fig. 1-5-5.
(Symptom: vertical sync absent, picture noise)
PB FM: Main board TP206
DRUM FF: Main board TP411

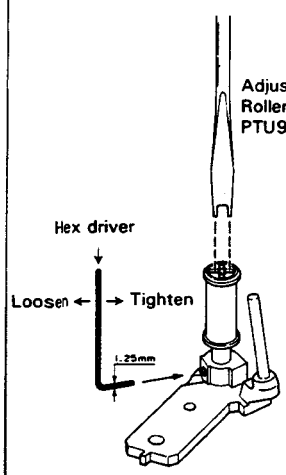


Fig. 1-5-4 S.T. Pole base

Fig. 1-5-5 FM linearity

$\frac{b}{a} \geqq 0.7$, $\frac{c}{a} \geqq 0.65$, $\frac{d}{a} \geqq 0.65$

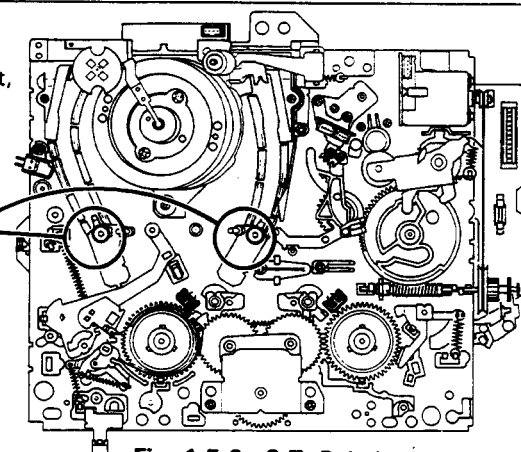
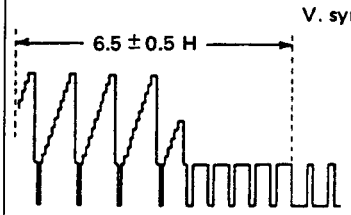
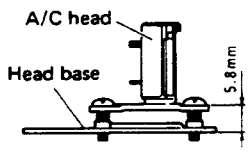
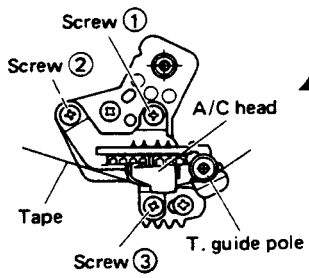
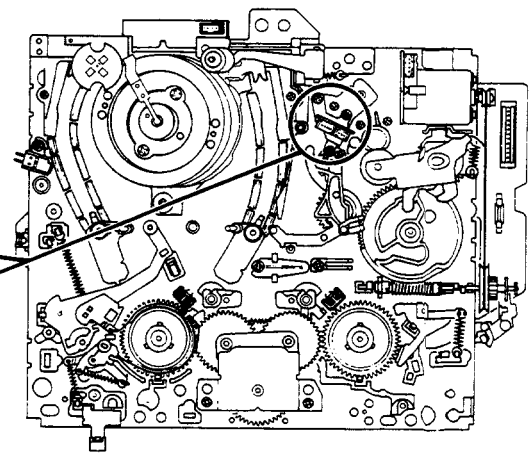
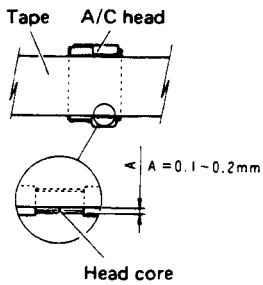
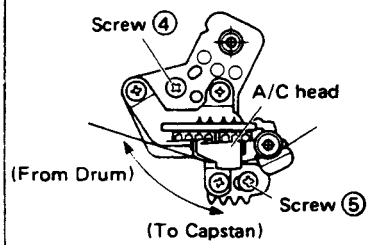
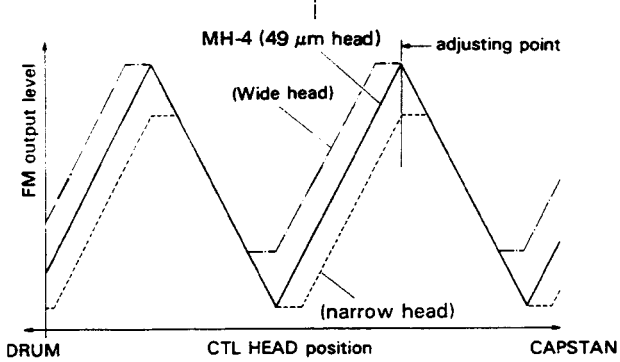


Fig. 1-5-6 S.T. Pole base position

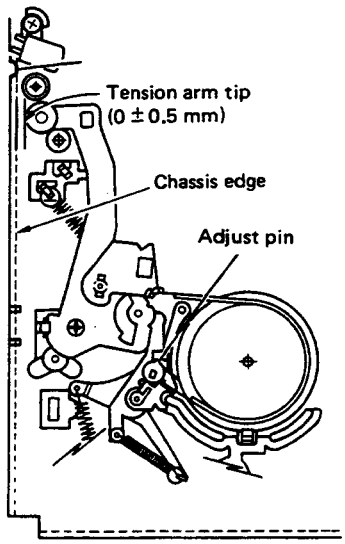
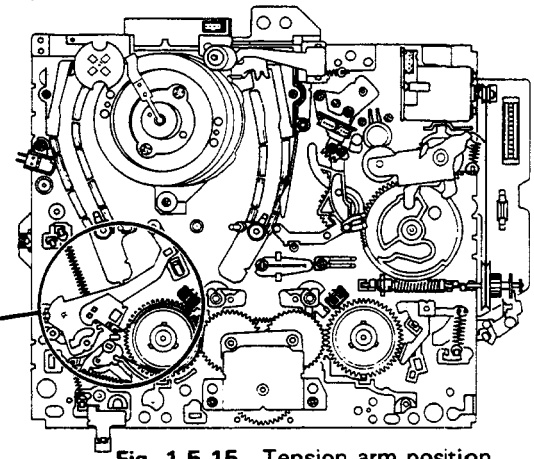
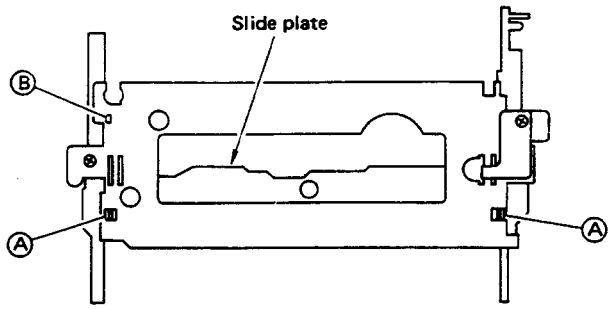
1) Play stairstep signal of the MH-2 Alignment Tape. Confirm absence of obvious FM waveform loss and that operating the Tracking yields the optimum point.
2) Refer to Fig. 1-5-4, adjust for loss at the left edge (drum entry) of the FM waveform by turning the guide roller of the supply pole base. Similarly, adjust for loss at the right edge (drum exit) by turning the guide roller of the take-up pole base.

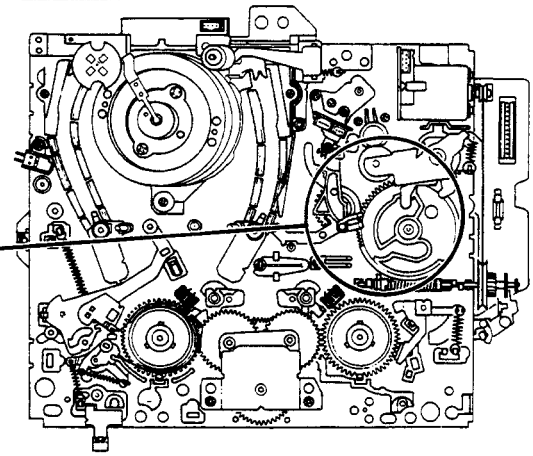
Note: ***If FM loss occurs on both channels and cannot be corrected by adjusting the guide rollers, the lower drum needs replacement.***

No.	Item	Checkpoints	Adjustment and Checks
	PB switching point •Symptom: switching noise at picture bottom.	VIDEO OUT  **Fig. 1-5-7** PB Switching Point	1) Connect an oscilloscope to TP210. 2) Set the MH-2 alignment tape into the cassette housing. Play back the stairstep segment of MH-2 alignment tape. 3) Trigger the oscilloscope externally (– slope) with the signal from TP411 (DRUM FF) of the main board. 4) Adjust R420 to position the trigger point 6.5 H ±0.5 H from V. sync as shown in Fig. 1-5-7.
2	Lower drum assembly •Symptoms: Poor FM linearity, noisy rotation, jitter •Cause: Lead and bearing wear	Check FM linearity and switching point.	See above upper drum assembly items.
		Check control head phase (X value) Symptom: tracking error PB FM: Main board TP206 DRUM FF: Main board TP411	1) Play stairstep signals of MH-2 Alignment Tape. Engage the Tracking Preset mode by pressing the + and – buttons simultaneously in the onscreen mode. Confirm that the same maximum FM waveform level is obtained as when the tracking is adjusted manually. 2) Refer to the A/C head adjustments.
3	A/C head  **Fig. 1-5-8** Temporary height  **Fig. 1-5-9** Inclination/Azimuth/ Height adj.	 **Fig. 1-5-10** A/C HEAD position	
		Temporarily set height as indicated in Fig. 1-5-8.	Set the height as indicated in Fig. 1-5-8 to facilitate tape transport checks and adjustments.
		Tilt (forward inclination) See Fig. 1-5-9. (Symptom: audio level varies greatly.)	1) Run tape, turn screw ① counterclockwise to where slight curling of the tape occurs at the lower flange of the take-up guide roller. 2) Then slowly turn the screw clockwise to where the curling ceases.
		Azimuth See Fig. 1-5-9. (Symptoms: audio low level or noisy) Audio output: Main board AUDIO OUT	1) Play stairstep signal (with audio 6 kHz) of the MH-2 Alignment Tape. Observe audio output signal with oscilloscope. 2) Turn screw ② and adjust for maximum audio output level.

No.	Item	Checkpoints	Adjustment and Checks
	 **Fig. 1-5-11** Height Adj	Height See Figs. 1-5-9 and 1-5-11. (Symptom: low audio and control signal levels)	1) Run tape and observe the control head area. 2) Turn screws ①, ② and ③ by small and equal amounts until 0.1 to 0.2 mm of the head core bottom can be seen. **Note:** *If difficult to observe, play stairstep signal of MH-2 Alignment Tape and adjust for maximum audio output and control pulse level.*
		FM linearity	Refer to upper drum assembly items. If adjustment is major, again check the azimuth.
	 **Fig. 1-5-12** CTL head phase	Control head phase See Fig. 1-5-12 PB FM: Main board TP206 DRUM FF: Main board TP411	1) Play stairstep signal of MH-2 Alignment Tape and observe the FM waveform. Set for Tracking Preset by pressing the + and − buttons simultaneously in the onscreen mode. 2) Loosen screws ④ and⑤. Set the A/C head positioning tool on screw ④, with the stud inserted into the nearby oblong hole. 3) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig. 1-5-13. 4) Tighten screw ⑤ . Remove the tool and tighten screw ④.
	 **Fig. 1-5-13** CTL head phase		

Note: *Trigger the oscilloscope externally signal from TP411 (DRUM FF). Use (+) trigger for MH-2 alignment tape.*

No.	Item	Checkpoints	Adjustment and Checks
4	Tension arm assembly Tension band assembly  Fig. 1-5-14 Tension arm assy	Tension pole position See Fig. 1-5-14. (Symptom: poor FM waveform response)	 Fig. 1-5-15 Tension arm position 1) Remove video cassette tape and set for the playback mode as following steps. 2) Disconnect VCR from AC. Slightly rotates the loading motor counterclockwise by hand, then press the lock level portion Ⓐ of the cassette housing by hand as shown in Fig. 1-5-16. 3) Move the raised portion of the cassette housing slide plate to fully forward by hand with loading motor. At this time, again press the lock level portion Ⓑ of the cassette housing slide plate to lower the cassette housing (internal holder of the cassette housing is locked in lowered position). 4) Cover the cassette LED with opaque material (insulated tape with black). 5) Connect VCR to AC. Press the power button on the Front panel and set for the playback mode. 6) Turn the eccentric adjust pin to align the edge of the chassis with the tension arm tip as shown in Fig. 1-5-14.
	 Fig. 1-5-16 Cassette housing	Back tension (Symptom: skew)	1) When the tension pole position is correctly adjusted, the back tension will assume the correct value. 2) Use the Back Tension Cassette Gauge and set for the playback mode. Confirm reading of 30 to 43. 3) Changing the tension pole position in order to vary the back tension will cause adverse effects elsewhere.

No.	Item	Checkpoints	Adjustment and Checks
5	Pinch roller cam Control cam Half loading gear assembly Guide arm assembly		Set mechanism to Eject mode (internal holder of the cassette housing is locked in raised) position.
			
			Fig. 1-5-17 Control cam position
		Important: Do not remove or disturb parts other than those mentioned. See Fig. 1-5-16.	1) When installing the pinch roller cam, overlap the largest hole of the gear portion with the hole of the deck. 2) Set the control cam on the deck with the hole of the groove overlapped with the hole of the deck. Observe that the small hole of the control cam and the ridge of the pinch roller cam are aligned. (If the control cam does not fit readily, shift the rear plate assembly within the range of play.) 3) Install the half loading gear assembly with the hole overlapped with the hole of the deck. Secure with E-ring. 4) Install the guide assembly over the spring and with the hole overlapping that of the deck. Engage the spring correctly.
		Cassette housing assembly	Install the cassette housing assembly with the mechanism in the Eject mode. Also observe that the inner holder of the housing is raised and locked.
6	Clutch assembly	Take-up torque (Symptom: inadequate take-up torque)	1) Remove cassette housing and set for play-back mode (see Section 1.2). 2) Set torque gauge on the take-up reel disk. Gradually relax your grip on the gauge and read the needle indication at the point the gauge begins to rotate with the disk. Confirm indication of 60 to 100.

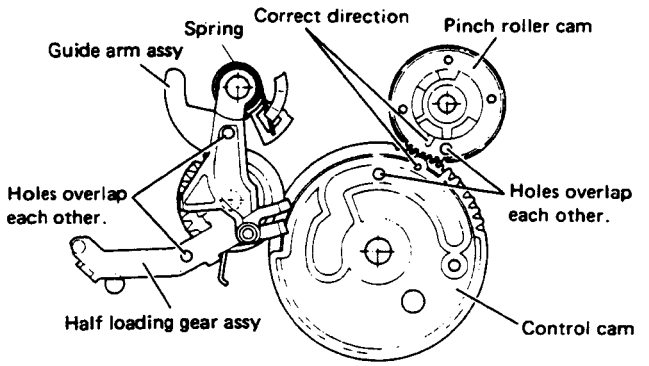


Fig. 1-5-16 Control/Pinch roller cam

No.	Item	Checkpoints	Adjustment and Checks
7	Take-up loading arm assembly Supply loading arm assembly Plate assembly		Note: • *Set mechanism to the Eject or Stop mode before removing these parts.* • *The flange of the plastic rivet securing the loading arm assembly and the pole base assembly can be damaged by attempting to remove it directly. Press the loading arm assembly firmly to prevent motion. Then use a narrow-shafted tool to press the rivet from the shaft end to remove it.*
		Mounting position alignment • Remove the tension arm assembly to facilitate operation. See Fig. 1-5-18.	1) Set the supply and take-up loading arm assemblies so that the holes of the gear portions are aligned, then secure to the pole base assemblies with rivets. 2) Shift the plate assembly and install with the holes of the upper and lower components overlapped.
		Slide switch See Fig. 1-5-18.	Be sure to engage the slide switch slider with the edge of the plate assembly.

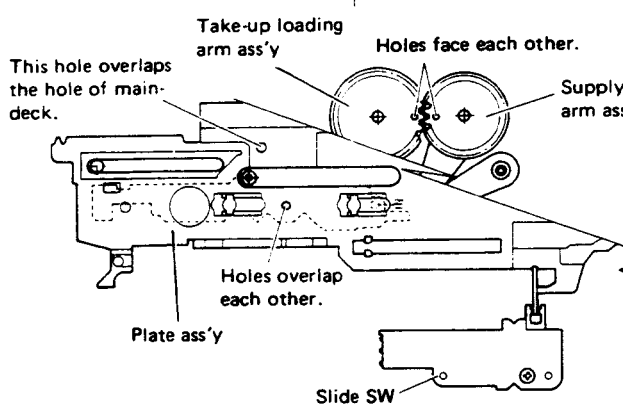


Fig. 1-5-18

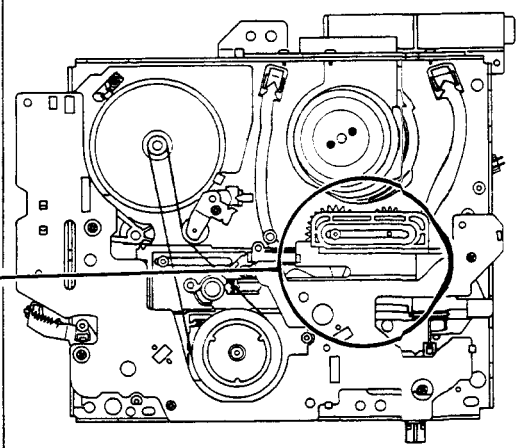


Fig. 1-5-19
T.S. Loading arm position

SECTION 2
ELECTRICAL ADJUSTMENTS

2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

2.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: PAL color bar, stairstep, video sweeper
9. Signal generator: Audio multiplex TV signal generator
10. Recording tape
11. Alignment tape: MH-2
12. Presetting unit: PTU94008.

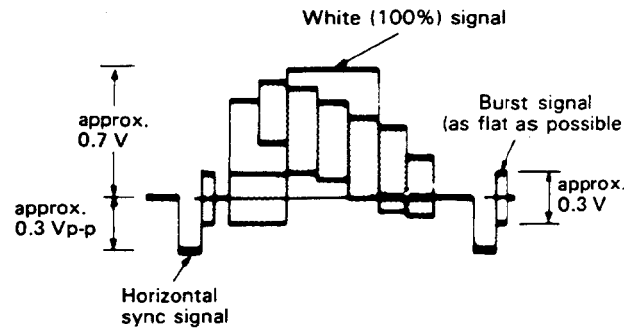


Fig. 2-1-1 Color bar signal of pattern generator

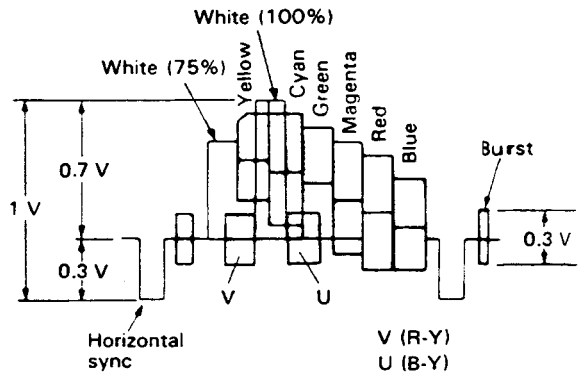


Fig. 2-1-2 Color bar signal waveform

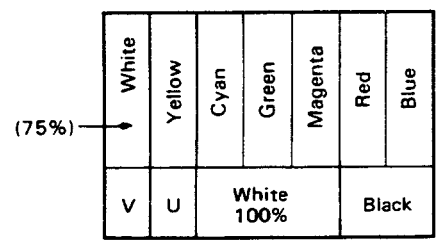


Fig. 2-1-3 Color bar pattern

2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

No. Checks and adjustments are numbered in the recommended sequence in which they are to be performed.

Item Name assigned to the particular check and adjustment step.

Check Point Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.

Adjustment Parts Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (—) indicates check only.

Signal & Mode

- Input signal required to perform adjustment. Dash (—) indicates that special signal is not required.
- Equipment operating mode at time of check or adjustment.

Color bars	Color bars signal as video input.
Stairstep	Stairstep signal as video input.
1 kHz	1 kHz sinewave as audio input signal.
MH-2 color bars	Color bars segment of MH-2 alignment tape.
MH-2 stairstep	Stairstep segment of MH-2 alignment tape.
MH-2 1 kHz	1 kHz audio signal segment of MH-2 alignment tape.
MH-2 RF sweep	RF sweep segment of MH-2 alignment tape.
E-E	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
SEARCH	Search (FWDS and REVS) playback mode
SLOW	Slow motion playback mode
STILL	Pause during playback mode
SP mode	SP recording speed

Description This column provides an explanation of the step, notes and adjustment values, and reference to waveforms where applicable.

2.2 SWITCHING REGULATOR CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	5V DC output voltage	• REC	•TUNER •SP	•Q806-B •TP803 (GND)	•R811	1) Connect a digital voltmeter between Q806-B and TP803. 2) Record in the TUNER mode, adjust R811 for 5.3±0.05 V.

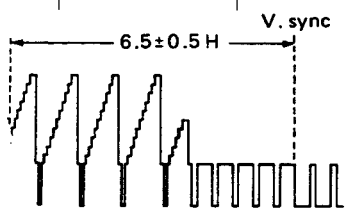
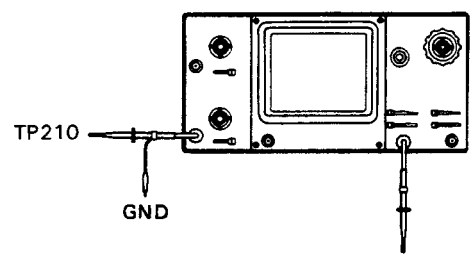
2.3 TIMER CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the T/D/S board.*

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	Clock	• EE	•AUX	•IC1-16	•C6	Note: ***For below adjustments use 10:1 probe with input capacitance lessthan 100 pf.*** 1) Disconnect VCR from AC. Connect a frequency counter between IC1-16 and GND. 2) Short IC1-8 to GND, then short the leads of capacitor C3 once in order to reset IC1. 3) Connect VCR to AC. All FDP Segments are on. 4) Adjust C6 for 2048.000±0.002 Hz (488.2808 to 488.2818 μs).

2.4 SERVO CIRCUIT

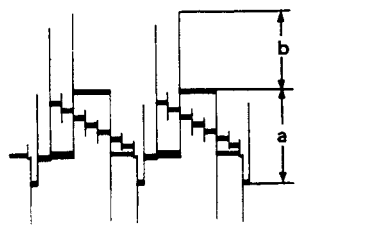
Note: ***Unless otherwise specified, all test points and adjustments are located on the MAIN board.***

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	SP PB switching point	• PB	• MH-2 stairstep • SP • Trigger slope (−)	• TP210	• R420	1) Connect an oscilloscope to TP210. 2) Play back the stairstep segment of MH-2 alignment tape. 3) Trigger the oscilloscope externally (− slope) with the signal from TP411. 4) Adjust R420 to position the trigger point 6.5±0.5 H from V. sync.  Fig. 2-4-1  Fig. 2-4-2
2	SP slow tracking preset	• REC then PB (slow)	• SP	• TV monitor	• Presetting unit (PTU-94008)	**Note:** ***Set VCR to A mode by remote controller.*** 1) Set recording video tape into the cassette housing. 2) Receive a colour broadcast on a VHF-HI channel or supply a colour bar signal to VIDEO IN. 3) Record a colour broadcast or colour bar signal in the SP mode. 4) Play back recorded signal in the FWD slow mode and set the tracking control of the FRONT panel to the center position by simultaneously pressing the (+) and (−) tracking buttons. 5) Observe the display one a monitor-TV and adjust for optimum noise condition (best tracking) by depressing "B (−)" or "C (+)" buttons of presetting unit as required. 6) Depress the STOP button on the FRONT panel. 7) Confirm that the bar noise is not visible on the monitor in the slow mode.

2.5 VIDEO CIRCUIT

Note: ***Unless otherwise specified, all test points and adjustments are located on the VIDEO unit board.***

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
	IMPORTANT: Item 1,2,3 and 4 1. Ordinarily avoid performing these adjustments. It should be performed only if IC1 of the VIDEO UNIT board has been replaced. 2. To adjust, replace fixed resistor with variable resistor, then adjust as required.					
1	EE level & White clip	• EE	•Colour bar	•CN207-15 (Main board) •IC1-22	•R60 •R64	1) When IC1 of the VIDEO UNIT board is replaced, it may also be necessary to replace R60 and R64 with adjustable resistors. 2) Confirm 2.00 ($^{+0.07}_{-0.05}$) Vp-p EE level at CN207-15 and white clip of 90±4% at IC1-22. If necessary, replace R60 with NVP1301-103NU and R64 with NVP1301-332NU. 3) Supply a colour bar signal to VIDEO IN, connect one channel of a dual trace oscilloscope to CN207-15 and the other channel to IC1-22. 4) Alternately adjust R60 and R64 for 2.00 ($^{+0.07}_{-0.05}$) Vp-p at CN207-15 and white clip of 90±4% at IC1-22.
2	Carrier & Deviation	• EE	•AUX	•CN206-9 (Main board)	•R41	1) When IC1 of the video unit board is replaced, it may also be necessary to replaced R41 and R42 with adjustable resistors. 2) Play back a colour bar segment of MH-2 and confirm 1.00 (±0.06) Vp-p Y level at VIDEO OUT (75Ω load). If necessary, replace R41 with NYVP1301-223NU and R42 with NVP1301-103NU. 3) Without an incoming signal. Terminate VIDEO OUT with TV-monitor (75Ω load), connect a frequency counter to CN206-9 on the MAIN board. 4) Adjust R41 for 3.8±0.04 MHz. 5) Play back a colour bar segment of MH-2, and confirm 1.00 (±0.06) Vp-p at VIDEO OUT. If necessary, redplace R17 with NVP1301-222NU.
		• REC then PB	•Colour bar •SP •AUX	•TP210 Video out (Main board)	•R42	6) Record and play back a colour bar signal. If necessary, before recording, adjust R42 so that the Y level becomes 1.00 (±0.06) Vp-p at VIDEO OUT during playback mode.



a : b = 100 : 90

Fig. 2-5-1 White clip

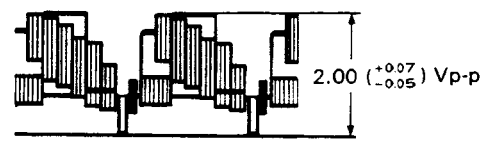


Fig. 2-5-2 VIDEO OUT

IMPORTANT:
Ordinarily avoid performing this adjustment. It should be performed only if IC1 of the VIDEO UNIT board has been replaced or if significant waveform distortion and S/N deterioration occur during recording and playback due to deficient adjustment of the carrier set and deviation.

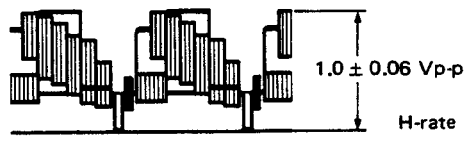


Fig. 2-5-3 Carrier and deviation

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
3	YNR NC balance	• EE	•Colour bar •AUX	•IC1-9	•R56	1) When IC1 of the video unit board is replaced, it may also be necessary to replace R56 with adjustable resistor. 2) Supply a colour bar signal to VIDEO IN, connect an oscilloscope to IC1-9 on the VIDEO UNIT board. 3) Confirm minimum DC step difference. If necessary, replace R56 with NVP1301-152NZ. 4) Adjust R56 for minimum DC step difference.
4	PB Y level	• REC then PB	•Colour bar •SP •AUX •TP411 (DRUM FF) Main board	•CN207-15 (Main board)	•R17	1) When IC1 of the video unit board is replaced, it may also be necessary to replace R17 with adjustable resistor. 2) Record and play back a colour bar signal, confirm 2.00 ($^{+0.07}_{-0.05}$) Vp-p Y level at CN207-15. If necessary, replace R17 with NVP1301-222NU. 3) Connect oscilloscope to CN207-15. 4) Record and play back a colour bar signal, adjust R17 for 2.00 ($^{+0.07}_{-0.05}$) Vp-p at CN207-15.
5	REC FM level	• REC	•Colour bar •SP	•TP3 (Pre/Rec board)	•R246 (Main board)	1) Supply a colour bar signal to VIDEO IN, connect an oscilloscope to TP3 of the PRE/REC board. 2) Record the colour bar signal in the SP mode. 3) Adjust R246 for 0.42 Vp-p pedestal level between centers of the waveform outline at the pedestal portion.

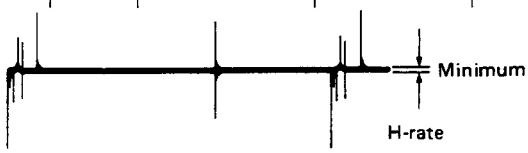


Fig. 2-5-4 YNR NC balance

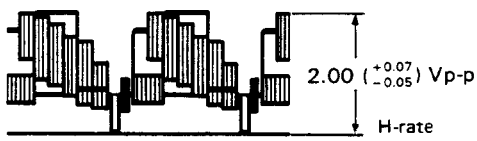


Fig. 2-5-5 PB Y level

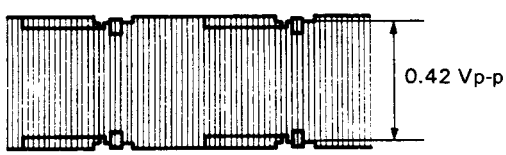


Fig. 2-5-6 REC FM level

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
6	REC colour level and Ch balance	• PB	• MH-2 colour bar • SP • Auto tracking off	• IC1-41	• R215 (Main board)	1) Connect an oscilloscope to IC1-41 and observe colour signal level. 2) Set the MH-2 alignment tape into the cassette housing, play back the colour bar segment of MH-2 alignment tape. 3) Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "−" tracking buttons. 4) Adjust by pressing the "+" and "−" tracking buttons of the Front panel for maximum level of the colour waveform and make a note of the higher colour level "A". 5) Press the STOP button on the FRONT panel and eject the MH-2 alignment tape.
		• REC then PB				6) Set recording video cassette into the cassette housing. Supply a colour bar signal to VIDEO IN. 7) Trigger the oscilloscope externally with the signal from TP411 (DRUM FF) of the Main board. Use (−) trigger for CH1 and (+) triger for CH2. 8) Record a colour bar signal in the SP mode. 9) Play back recorded colour bar signal. Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "−" tracking buttons and confirm 85±5% of the noted colour level at IC1-41. If necessary, before recording, adjust R215 so that the higher level channel becomes 85±5% of the noted level "A" during playback as shown in Fig. 2-5-7. At this time, confirm that the channel level difference is within 3 dB. **Note:** ***Repeat the above step (9) several times.***

Fig. 2-5-7 REC colour level

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
7	SP PB Frequency	• REC then PB	•Video sweep •SP •Auto tracking off	•TP210 (Main board)	•R208 (Main board)	1) Terminate VIDEO OUT with monitor - TV (75 Ω load), supply a video sweep signal without burst to VIDEO IN. 2) Set recording video cassette into the cassette housing. Record a video sweep signal without burst in the SP mode. 3) Connect an oscilloscope to TP210. Play back recorded video sweep signal in the SP mode, set the tracking of the Front panel to the Auto tracking off position by simultaneously pressing the (+) and (−) tracking buttons. 4) Use the control of the oscilloscope to position the 100 kHz region at graduation 3 (0 dB) of the oscilloscope scale. 5) Adjust R208 to position the 2 MHz of channel-1 portion at 2.4 — 3.0 (−1 ± 1 dB) of the oscilloscope graduations as shown in Fig. 2-5-8. At thie time, confirm that the channel difference is within 2 dB.
			•TV broadcast •Auto tracking off	•TV monitor		**Alternate method** 1) Set recording video cassette into the cassette housing, receive a colour broadcast on a VHF channel. 2) Record a colour broadcast that shows a good depiction of human facial contours. 3 Play back recorded colour broadcast, set the tracking of the Front panel to the Auto tracking off position by simultaneously pressing the (+) and (−) tracking buttons. 4) Adjust R208 to obtain distinct facial features on the monitor. **Note:** ***R208 nearly at centre position.***
8	SECAM DET	• EE	•SECAM colour bar	•TP280 (Main board)	•L282 (Main board)	1) Connect an oscilloscope to TP280. 2) Adjust L282 so that A and B are related as follows: A : B = 3 : 4

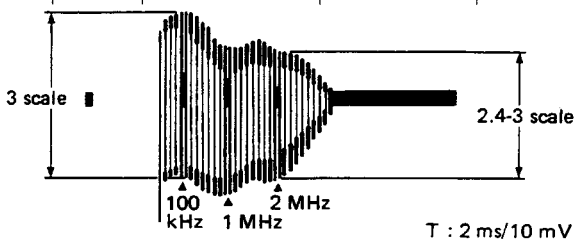


Fig. 2-5-8 PB frequency

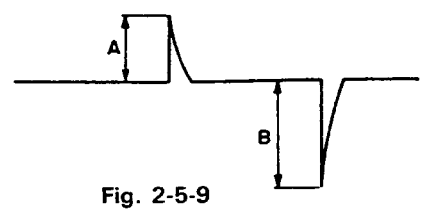


Fig. 2-5-9

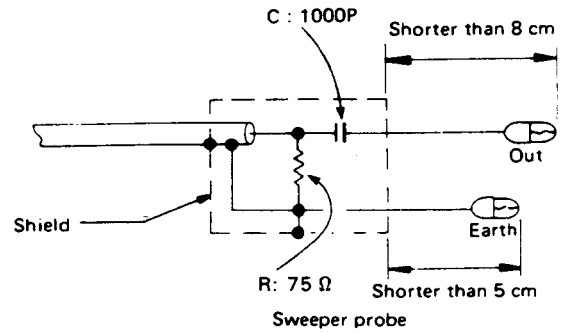
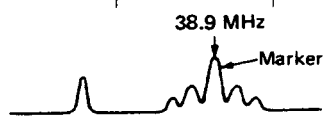
2.6 AUDIO CIRCUIT

Note: ***Unless otherwise specified, all test points and adjustments are located on the MAIN board.***

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	Audio Bias level	• REC	•No input signal •SP •AUX	•TP31 (+) •TP32 (−)	•R11	1) Connect a millivoltmeter between TP31 and TP32. 2) Set for REC mode without incoming signal. 3) Adjust R11 for 3.1 mVrms.

2.7 TUNER/IF CIRCUIT

Note: ***Unless otherwise specified, all test points and adjustments are located on the TUNER/IF board.***

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
Equipment required: 1. Oscilloscope 2. IF sweep signal generator with suitable markers (PIF, etc.) 3. Sweeper probe (sweep signal supply cable) as shown below.						 **Fig. 2-7-1**
1	VCO	• EE	•Tuner	•IC1-17	•T1	1) Use a sweeper probe as shown in Fig. 2-7-1 and connect the sweep generator output to pin 1 of SAW 1. Adjust the sweep gain so that the waveform does not distort as observed with the oscilloscope. Connect the oscilloscope to pin 17 of IC1 (VIDEO DET OUT) and adjust T1 to align the waveform with the frequency marker as shown in Fig. 2-7-2.
						 VCO and sweep signal (beat) **Fig. 2-7-2**
			•Tuner •TV broadcast	•TV monitor	•T1	**Alternate methjod:** 1) Receive a colour broadcast on a VHF-HI channel. 2) Adjust T1 to obtain a fine picture on the monitor.
• **Before the following adjustments:** 1. Connect a cable to ANT IN and terminate TV OUT at 75 Ω. 2. Set a TV channel signal generator as follows. Video: 65 dBμ/75 Ω, colour bar 87.5% modulation Audio: 55 dBμ/75 Ω, 1 kHz ± 50 kHz deviation						
2	RF AGC	• EE	•Tuner •TV broadcast	•TV monitor	•R72	1) Connect the oscilloscope to IF terminal of U/V Tuner (Front end). Adjust R72 for maximum level, then again adjust R72 for −8 dB again.
						Alternate method: **Note:** ***Adjust R21 (RF AGC) to correct for excess noise in the picture or when streaky cross interference occurs due to strong electrical fields.*** 1) Adjust R72 to minimize noise or streaks on the TV monitor. 2) Check for absence of abnormality on all channels.

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
3	SOUND DET	• EE	• Tuner • TV broadcast	•CN2-5	• T3	1) Use a adjustment circuit as shown in Fig. 2-7-3, and connect a distortion meter as shown in Fig. 2-7-3. 2) Adjust T3 for minimum distortion (less than 2.0%). **Alternate method:** 1) Receive a colour broadcast on a VHF-HI channel (7 to 13). Connect an oscilloscope to CN2-5. 2) Adjust T3 for maximum level at audio sound.

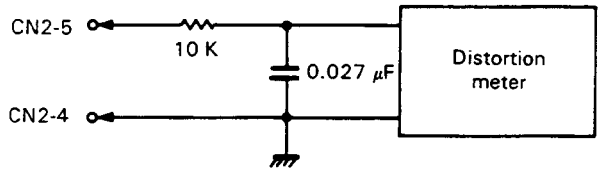
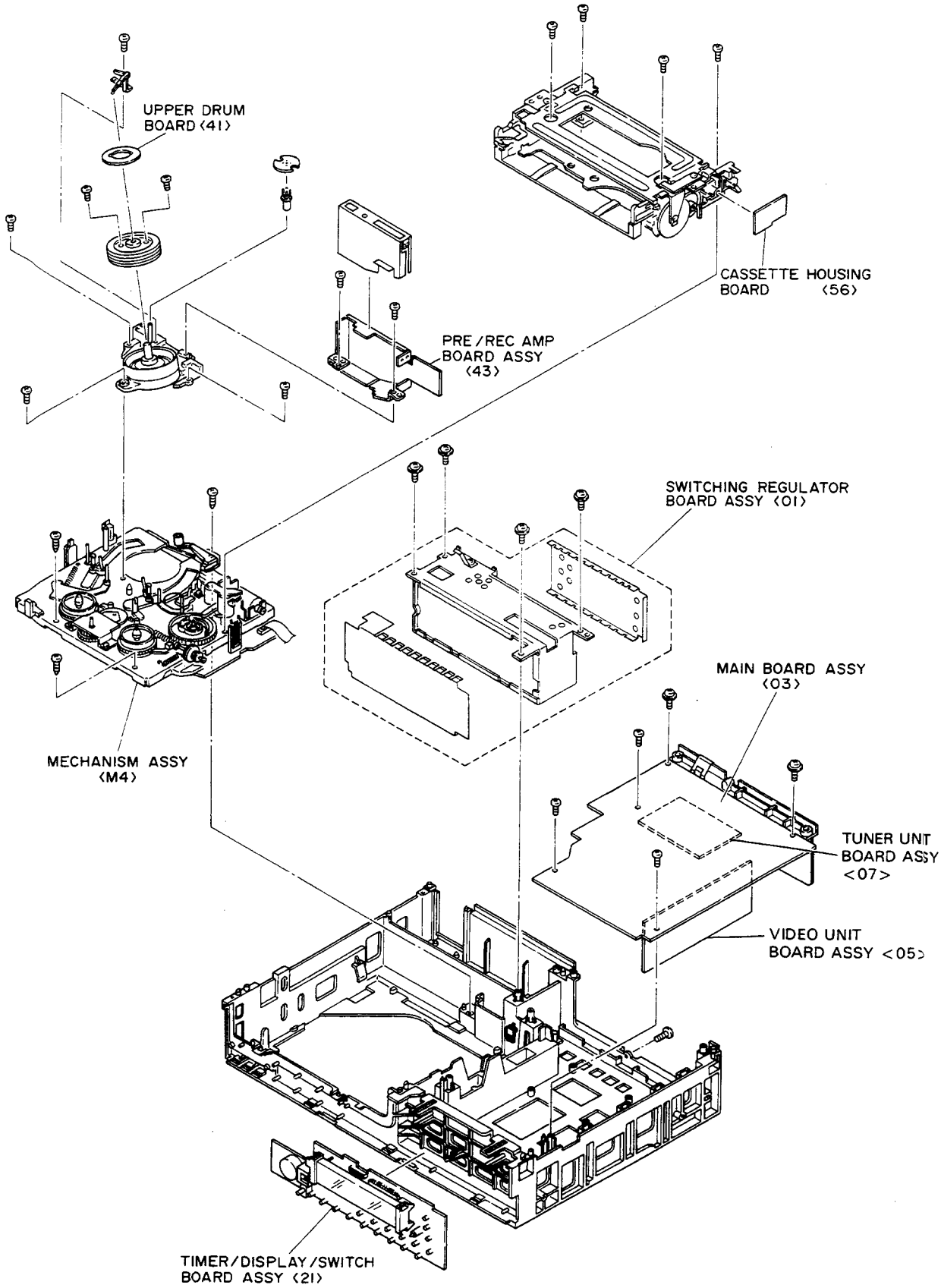


Fig. 2-7-3

SECTION 3
CHARTS AND DIAGRAMS

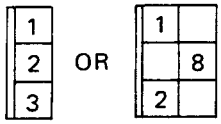
3.1 CIRCUIT BOARD AND LOCATION



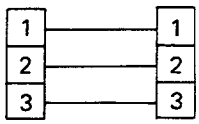
3.2 GENERAL INFORMATION

3.2.1 Connections

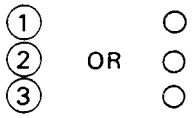
Note:
Unless otherwise specified, only signal input flow is indicated.
Connection arrows indicate only signal outputs.



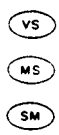
: Connectors



: Board in connectors



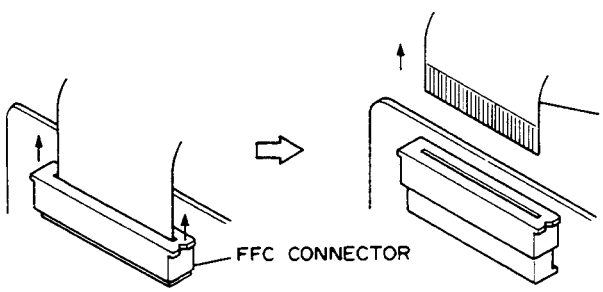
: Direct connections



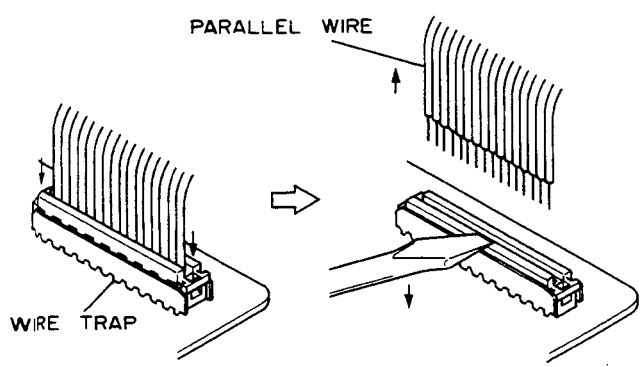
: Connected pattern in the board.
Abbreviations
V : Video M : Mechacon
S : Servo A : Audio
VS : Signal flow from video to servo.

3.2.2 Disconnecting the flatwire

1. Pull the connector structure upward to release the clamp when removing or inserting the flat wire cable.

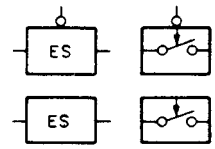


2. Depress the connector structure downward to release the clamp when removing or inserting the flat wire cable, as indicated below.



3.2.3 Indications

AUX : Active only at high.
$\overline{AUX}$: Active only at low.
$\bar{A}U\bar{X}$: Active only at middle.
$\bar{A}U\bar{X}$: Active only at open.



: Active only at low for electronic switch.
: Active only at high for electronic switch.

: Low pass filter.

: High pass filter.

: Band pass filter.

: Limiter.

: Detector

: Amplifier.

: Mixer stage.

3.2.4 Schematic diagram values

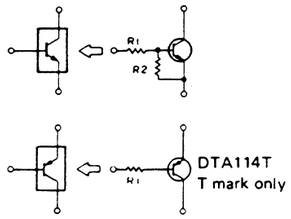
Unless otherwise specified.
1. All resistance values are in ohms, 1/6 W or 1/8 W (refer to parts list).
2. All capacitance values are in μF, (P; PF).
3. All inductance values are in μH, (m; mH).
4. All diodes are 1SS133 or MA165, (refer to parts list).
5. Voltages are DC-measured (reference to ground) with a digital voltmeter during recording (SP mode) and playback (SP mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parenthesis.
6. Waveforms (VIDEO System) are measured (reference to ground) with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (reference to ground) with 1 kHz (−8 dBs) during recording and playback with alignment tape (1 kHz).
8. Shaded ( ) parts are critical for safety. Replace only with specified part numbers.

3.2.5 Signal flow in the schematic

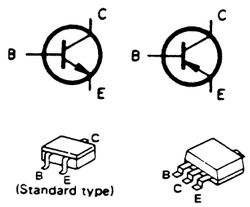
Recording signal path
Playback signal path
REC/PB signal path

3.2.6 Semiconductors

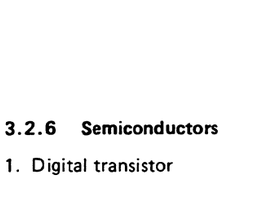
1. Digital transistor



2. Chip transistor



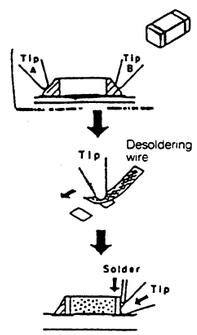
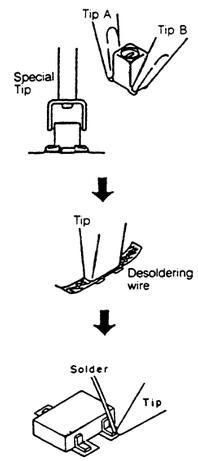
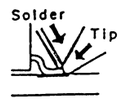
3. Chip diode

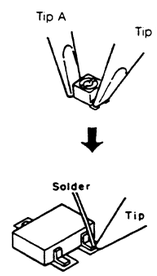
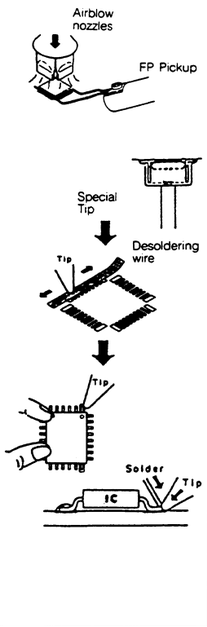


Note:
The digital transistor includes built in resistors. It features small size and high reliability.
Both PNP and NPN types are available.

Uses:
Inverter, interface, driver circuits.

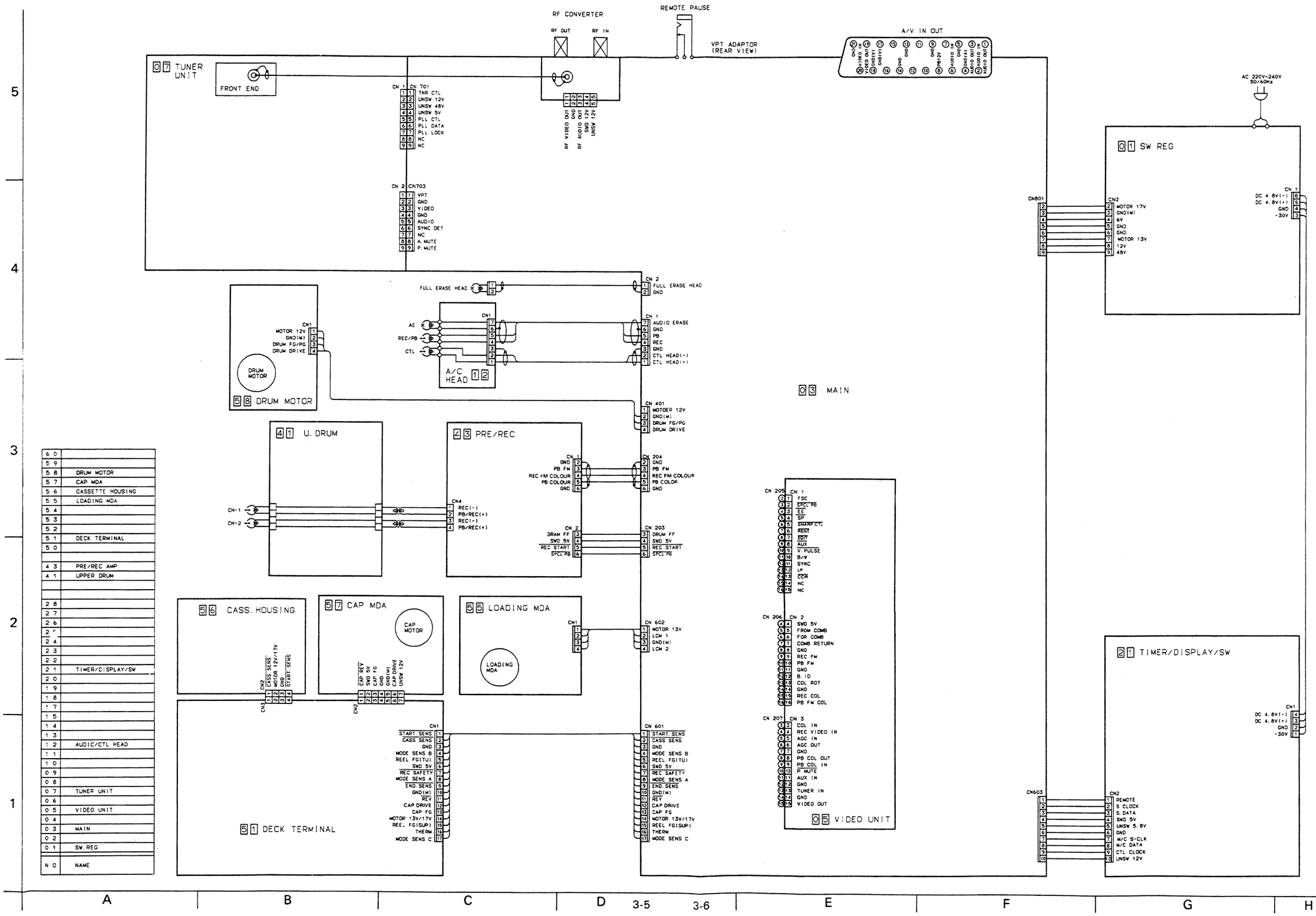
3.2.7 Basic knowledge of SMC* parts replacement

Products	Appearance	Replacement technology	Removal method	Installation method	Soldering tip types	Cautions
Thick Film Chip Resistors Carbon Film Chip Resitors Metal Film Chip Resistors Chip Ceramic Capacitors Chip Triming Resistors			• **Use 2 soldering irons** 1. Use thin tip soldering irons. 2. Use soldering tip temperature of about 280°C. 3. Simultaneously heat both ends of the part. 4. While heating, grasp the part with the tips of the soldering irons and remove it. 5. Use desoldering wire to completely remove the old solder from the part location of the board. 6. A clean pattern for installing the new part is very important.	1. Clean the area where the new part is to be moundted (use alcohol). 2. Apply flux. 3. Set part correctly into position, prevent it from shifting. 4. Bring the soldering iron tip close to the part contact without actually touching it. Melt thin (0.3 mm) solder between the tip and part so that it flows into the part contact. 5. Check work quality with a magnifier.	Thin tip type Small flat-blade tip type 	Some parts can be damaged by sudden heating. Preheat the part at about 100°C for several minutes before installing it. Do not touch the part body with the soldering iron. The thin (0.3 mm) solder for miniature parts does not contain adequate flux. Supplementary flux is thus needed in most cases. Set the position carefully and secure the part. A defective trimming resistor cannot be adjusted externally. Replace with an ordinary variable resistor.
Chip Inductors Chip Resistor Networks Chip Tantalum Capacitors Chip Tantalum Electrolytic Capacitors Chip Aluminum Electrolytic Capacitors Chip Transformers Chip Filters			• **Special desoldering iron** 1. Select soldering tip according to part size. 2. Bring the tip into contact with the soldered points. 3. When the solder melts, remove the part. 4. Remove the old solder with desoldering wire. • **2 soldering irons** 1. Use small flat-blade tips. 2. Heat both ends of the part simultaneously. 3. When the solder melts, grasp and remove the part with the soldering iron tips. 4. Remove the old solder with desoldering wire.	1. Clean the area where the new part is to be mounted (use alcohol). 2. Apply flux. 3. Set part correctly into position, prevent it from shifting. 4. Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that it flows into the part contact.  5. Check work quality with a magnifier.	Special Soldering tip Small flat-blade tip type Thin tip type 	Use care not to damage plastic components when soldering. Position the part carefully. This will also affect the soldering operation. Use care regarding soldering iron tip and avoid rapidly heating parts. For larger parts, use a slightly higher temperature (about 300°C). Check after installing (cold solder joints, etc.). Use care not to damage the circuit pattern, especially when removing.

Products	Appearance	Replacement technology	Removal method	Installation method	Soldering tip types	Cautions
Chip VRs Chip Trimmer Capacitors Diodes Transistors			• **2 soldering irons** 1. Use small flat-blade tips. 2. Heat the leads of the part simultaneously. 3. When the solder melts, grasp and remove the part with the soldering iron tips. 4. Remove the old solder with desoldering wire.	1. Clean the area where the new part is to be moundted (use alcohol). 2. Apply flux. 3. Set part correctly into position, prevent it from shifting. 4. Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that it flows into the part contact.	Thin tip type Small flat-blade tip type 	Use care not to damage the part when soldering. Check for solder joints, expecially miniature parts with small leads.
IC (SOP) (Small Outline Package) IC (SSOP) (Shrink Small Outline Package) IC (VSOP) (Very Small Outline Package) IC (QFP) (Quad Flat Package) IC (VQFP) (Very Small Quad Flat Package) IC (PLCC) (Plastic Leaded Chip Carrier) IC (TSOP) (Thin Small Outline Package)			• **Special desoldering iron** 1. Select the tip according to the size and shape of the IC. 2. "Tin" the tip with a small amount of solder. 3. Set the tip squarely over the IC leads. 4. When the solder melts, carefully twist the iron. 5. Raise and remove the IC. • **Shaped airblower unit** 1. Select the correct nozzle. 2. Select the temperature and airblow (suggested: temp. 7, airblow 4). 3. Engage the IC removing tool. 4. Use the airblow to preheat the IC for about 5 seconds, then heat with the nozzle until the IC remover lifts the part from the board.	1. Use desoldering wire to remove the previous solder. 2. Clean the location with alcohol. 3. Apply flux. 4. Position the IC and solder two pins at opposite sides. 5. Use a sharp tipped soldering iron and carefully solder each pin. (After gaining experience, a thicker tip can be used for better work efficiency.) 6. Remove any solder bridges with desoldering wire. 7. Inspect the work with a magnifier.	Special soldering tips. Airblow nozzles 	Do not reuse removed parts. Use care to avoid solder bridges. Remove any that occurs. Remove the old IC carefully so as not to damage the circuit pattern. Because of the many pins, cleanliness of the pattern is extremely important after removing the IC. Be very precise in positioning the IC. Soldering opposite pins first holds the IC in place and makes soldering the other pins easier. It is important to inspect the work with a magnifier. ICs (especially TSOP) are easily damaged by heat. Do not touch directly with the soldering iron.

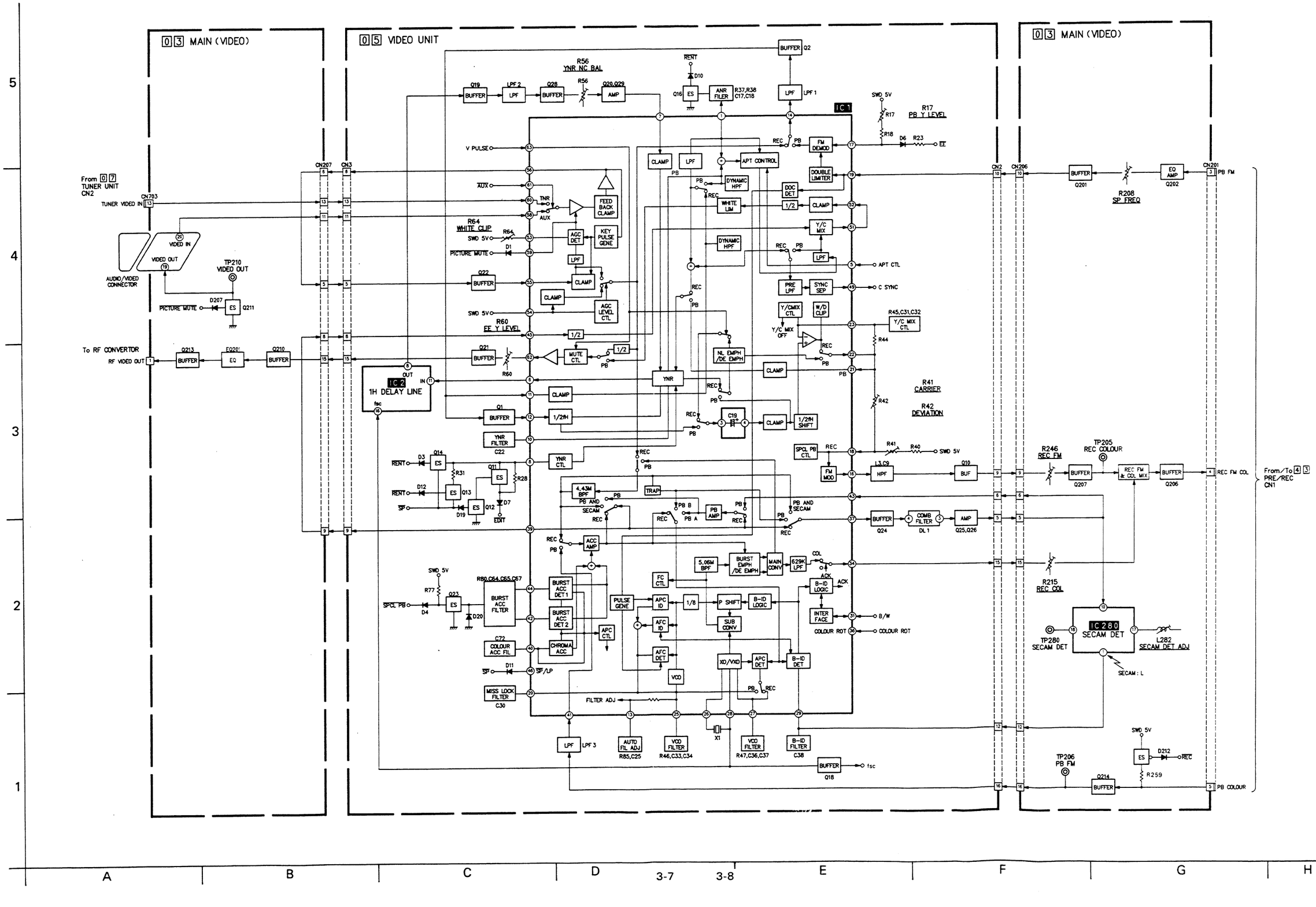
* SMC: Surface Mounted Component

3.3 BOARD INTERCONNECTIONS

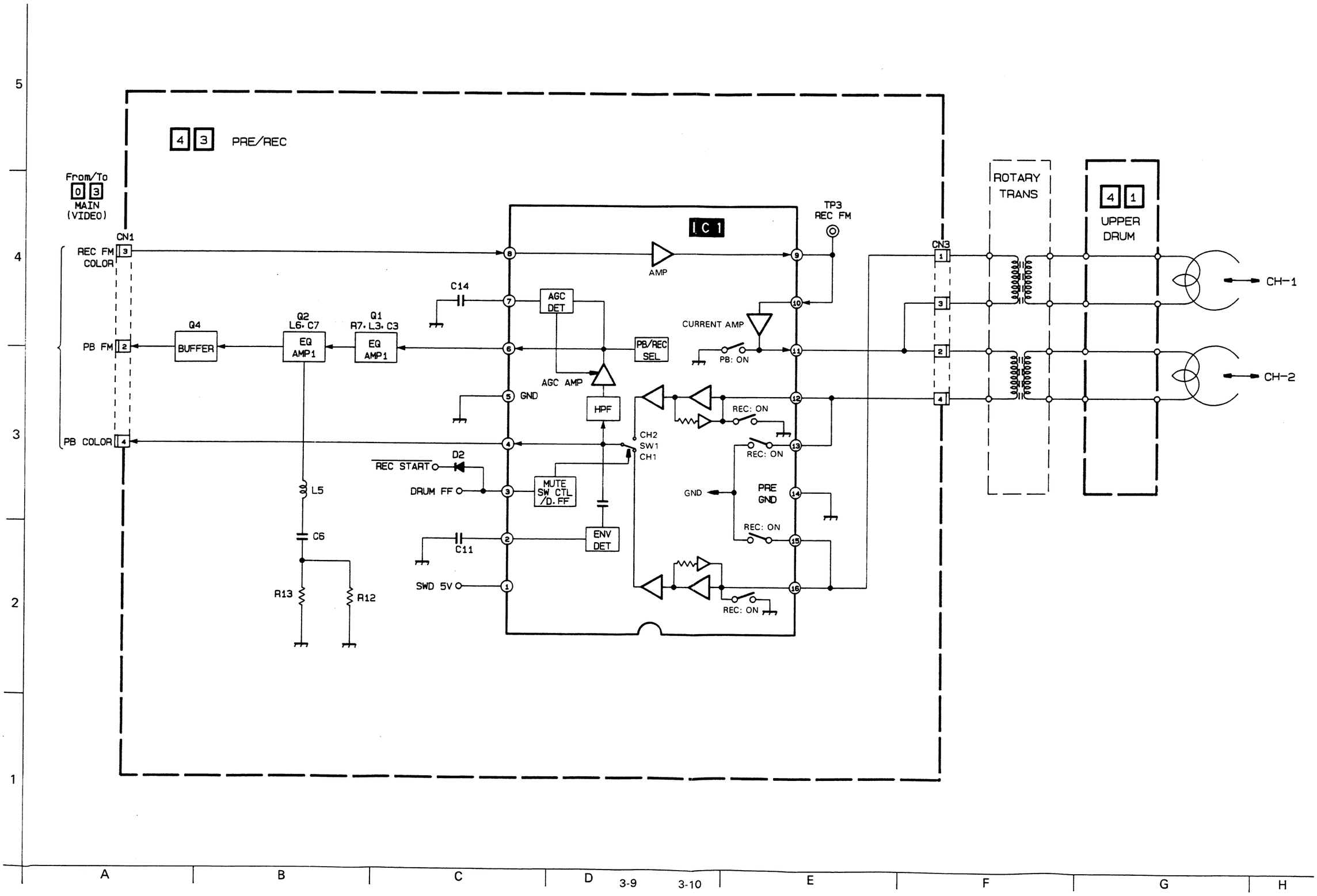


NO	NAME
60	
59	
58	DRUM MOTOR
57	CAP MDA
56	CASSETTE HOUSING
55	LOADING MDA
54	
53	
52	
51	DECK TERMINAL
50	
43	PRE/REC AMP
41	UPPER DRUM
28	
27	
26	
25	
24	
23	
22	
21	TIMER/DISPLAY/SW
20	
19	
18	
17	
15	
14	
13	
12	AUDIO/CTL HEAD
11	
10	
09	
08	
07	TUNER UNIT
06	
05	VIDEO UNIT
04	
03	MAIN
02	
01	SW. REG

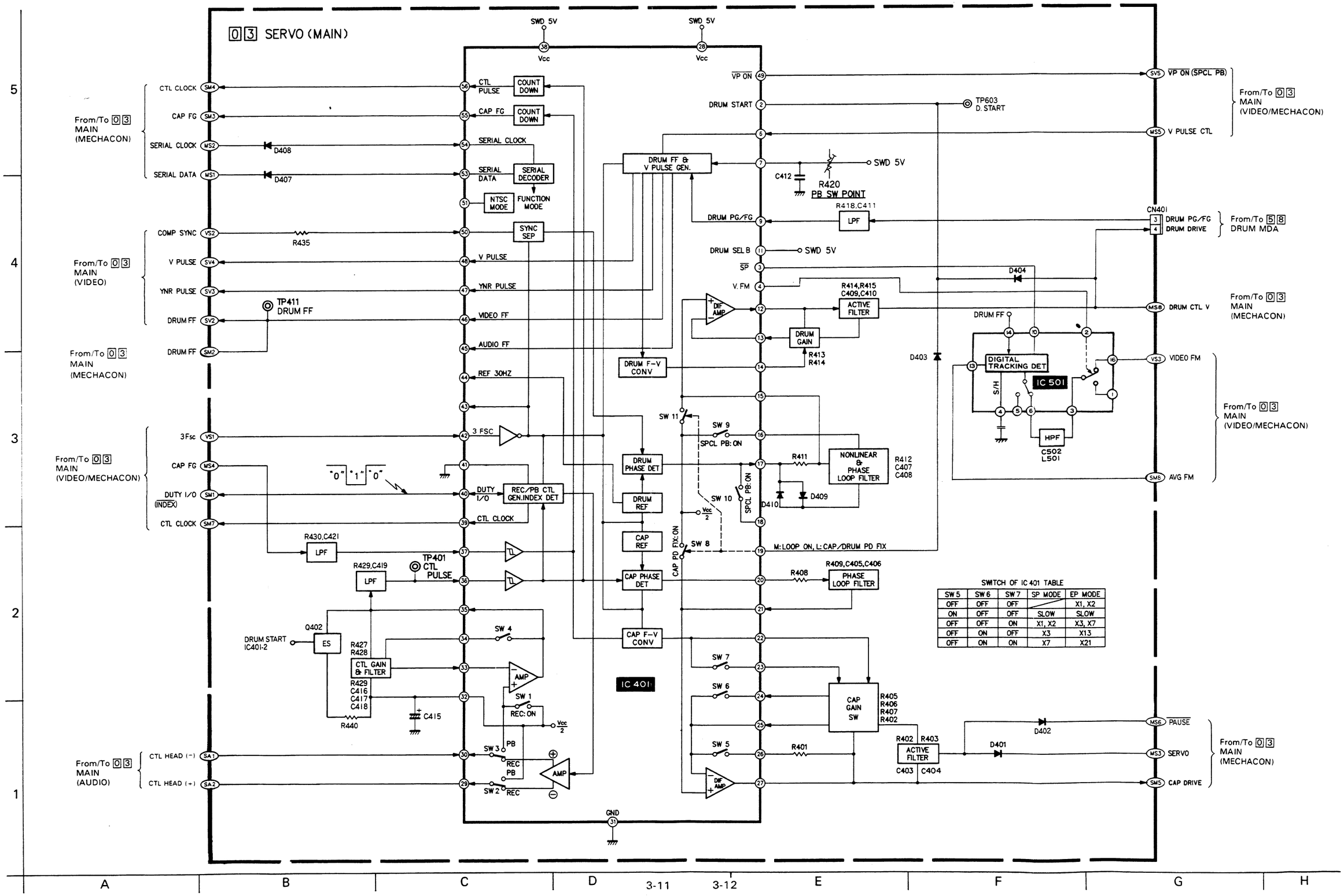
3.4 VIDEO BLOCK DIAGRAM



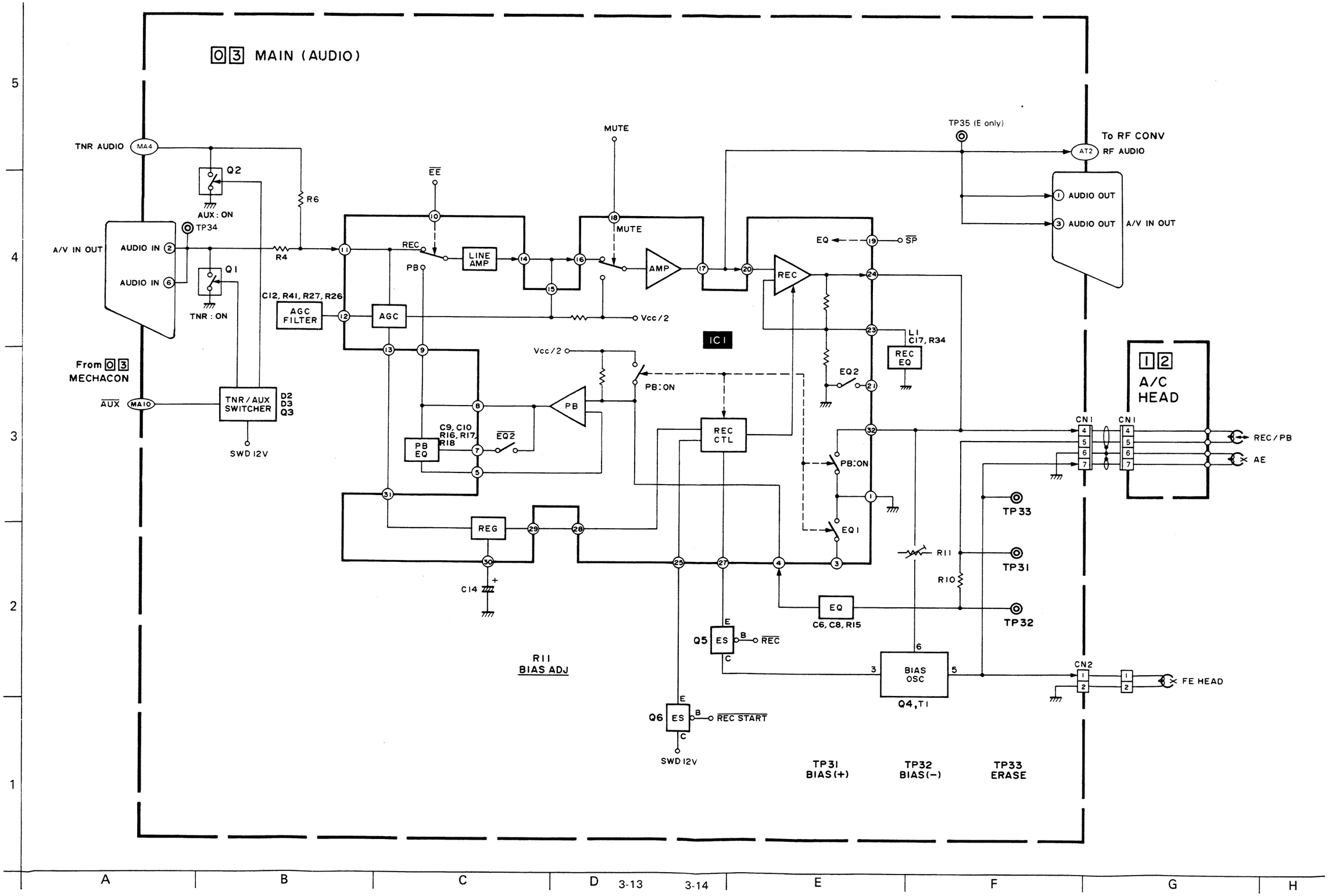
3.5 PRE/REC BLOCK DIAGRAM



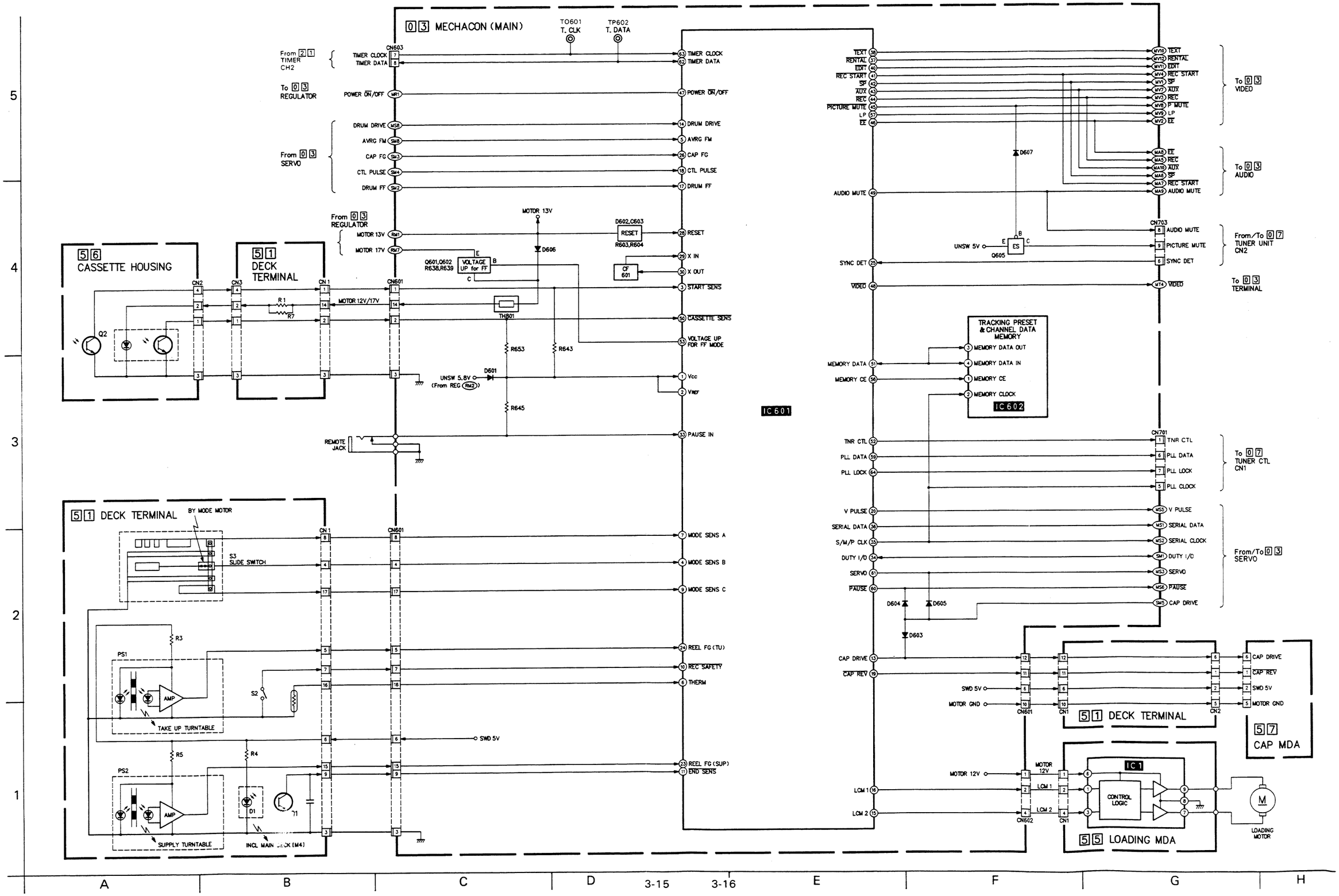
3.6 SERVO BLOCK DIAGRAM



3.7 AUDIO BLOCK DIAGRAM

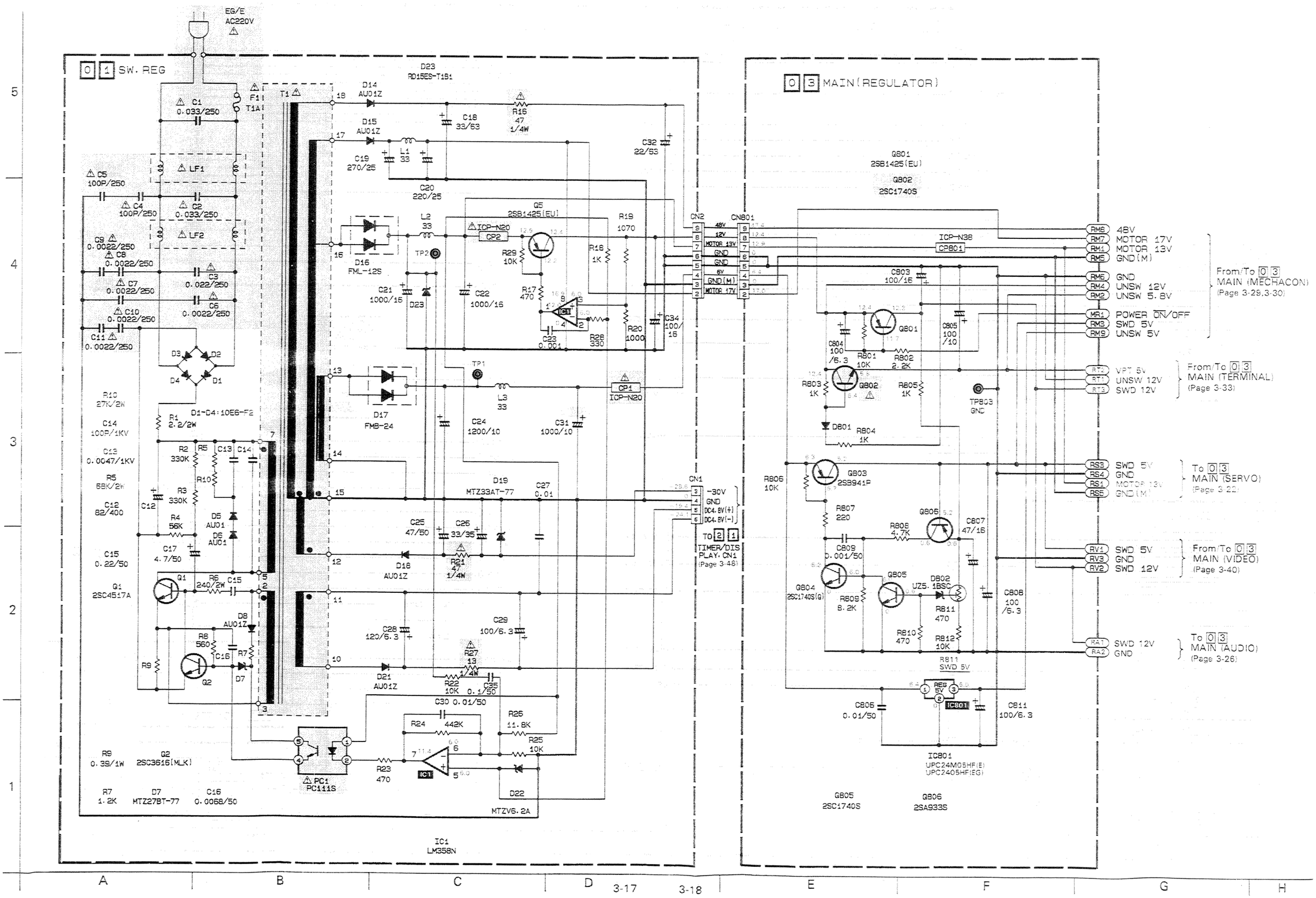


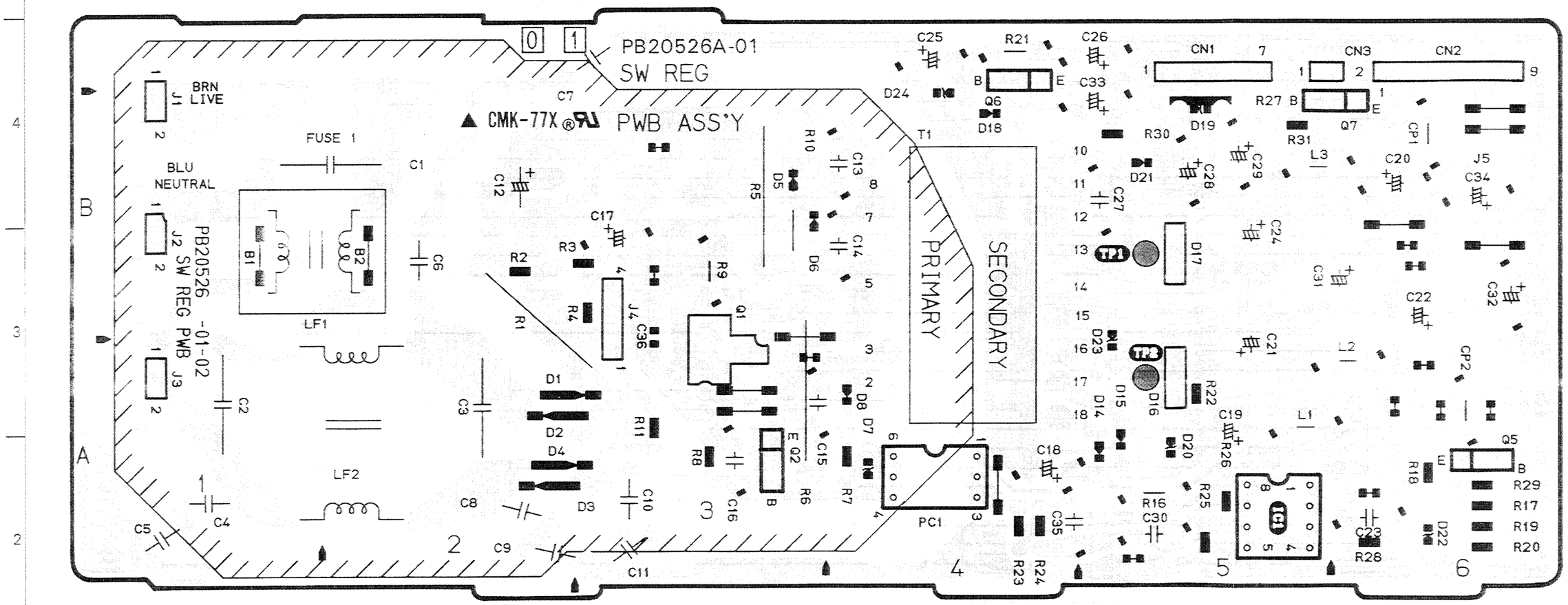
3.8 SYSTEM CTL BLOCK DIAGRAM



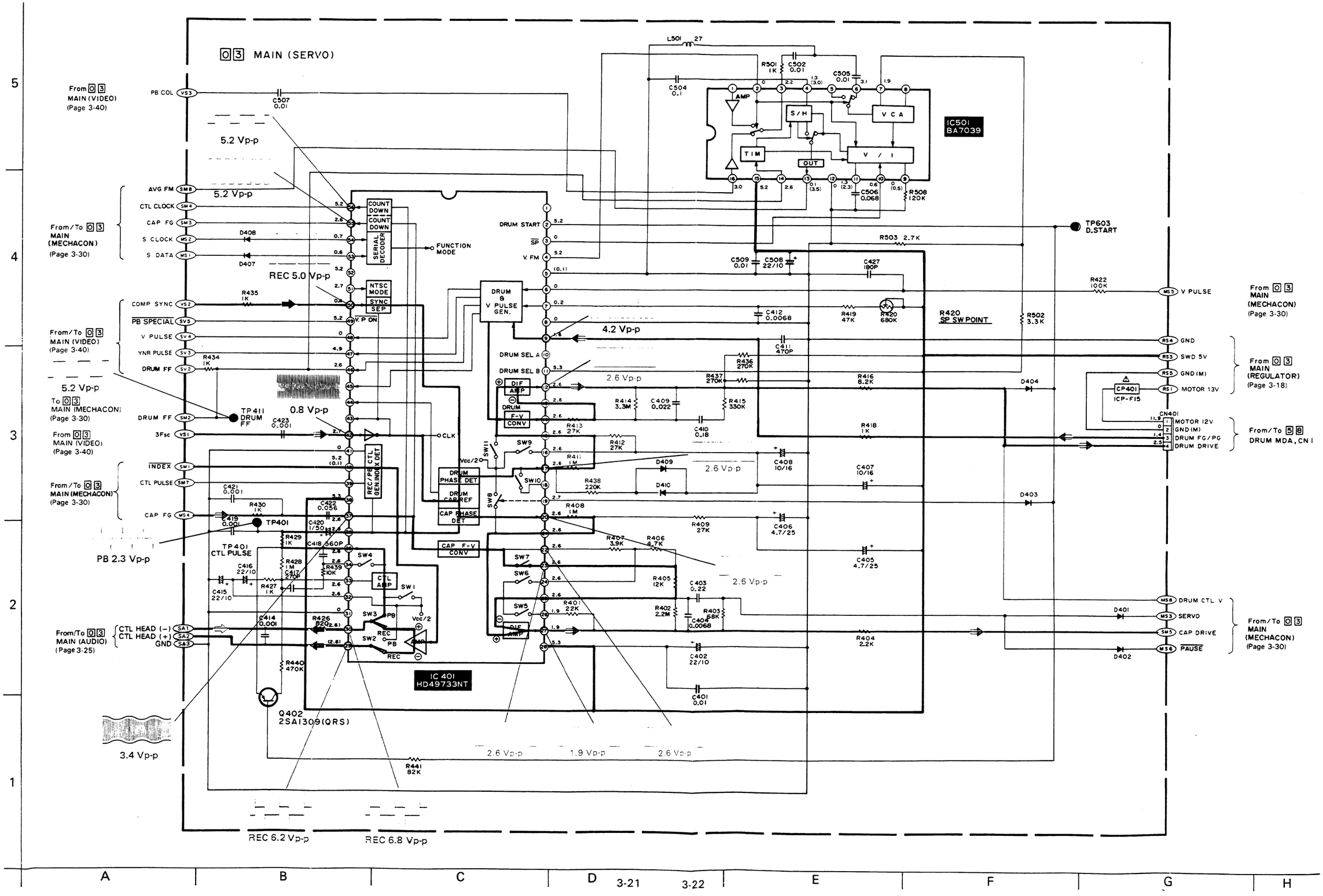
3-15 3-16

3.9 SWITCH REGULATOR & REGULATOR (MAIN) SCHEMATIC DIAGRAMS

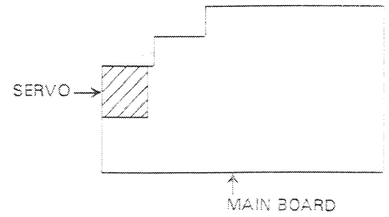



PB20526A-01
SW REG
▲ CMK-77X
PWB ASS'Y
BRN
LIVE
J1
BLU
NEUTRAL
FUSE 1
C1
PB20526
J2 SW REG
-01-02
REG PWB
J3
B1
B2
C6
LF1
LF2
C2
C3
C4
C5
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
C33
C34
C35
C36
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
D1
D2
D3
D4
D5
D6
D7
D8
D14
D15
D16
D17
D18
D19
D20
D21
D22
D23
D24
Q1
Q2
Q5
Q6
Q7
T1
PC1
J4
J5
L1
L2
L3
CP1
CP2
CN1
CN2
CN3
TP1
PRIMARY
SECONDARY

3.11 SERVO SCHEMATIC DIAGRAM



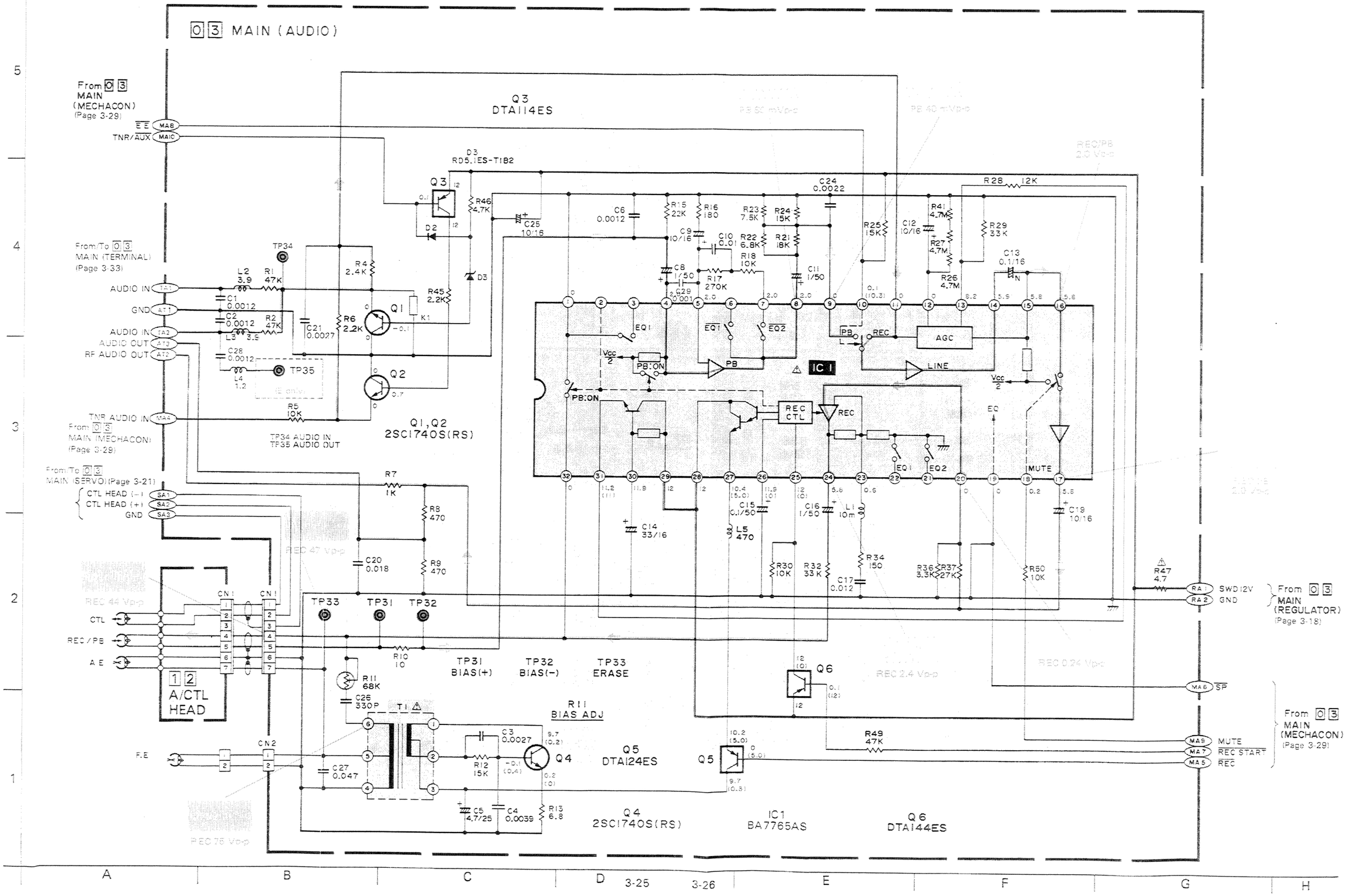
• MAIN board assembly is located in page 37,38

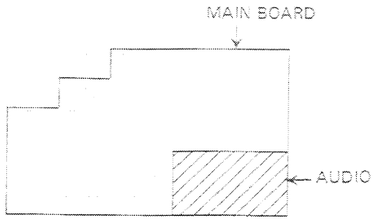


PU36557
MAIN UNIT ASS'Y

R420
SP PB SW POINT

3.13 AUDIO SCHEMATIC DIAGRAM



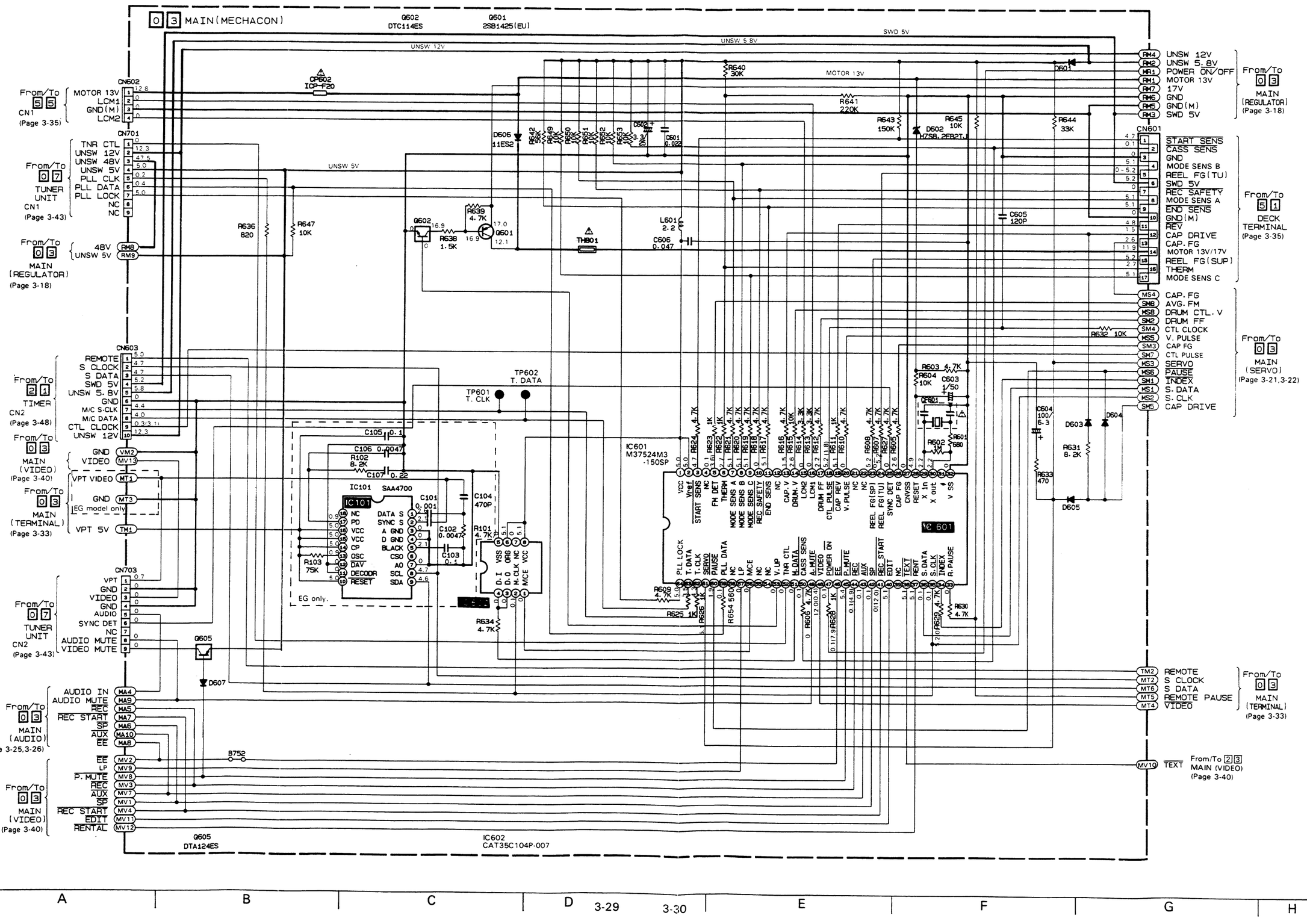


• MAIN board assembly is located in page 37,38

PB10553 -01-03
MAIN PWB

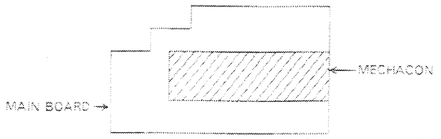
R11
BIAS ADJ

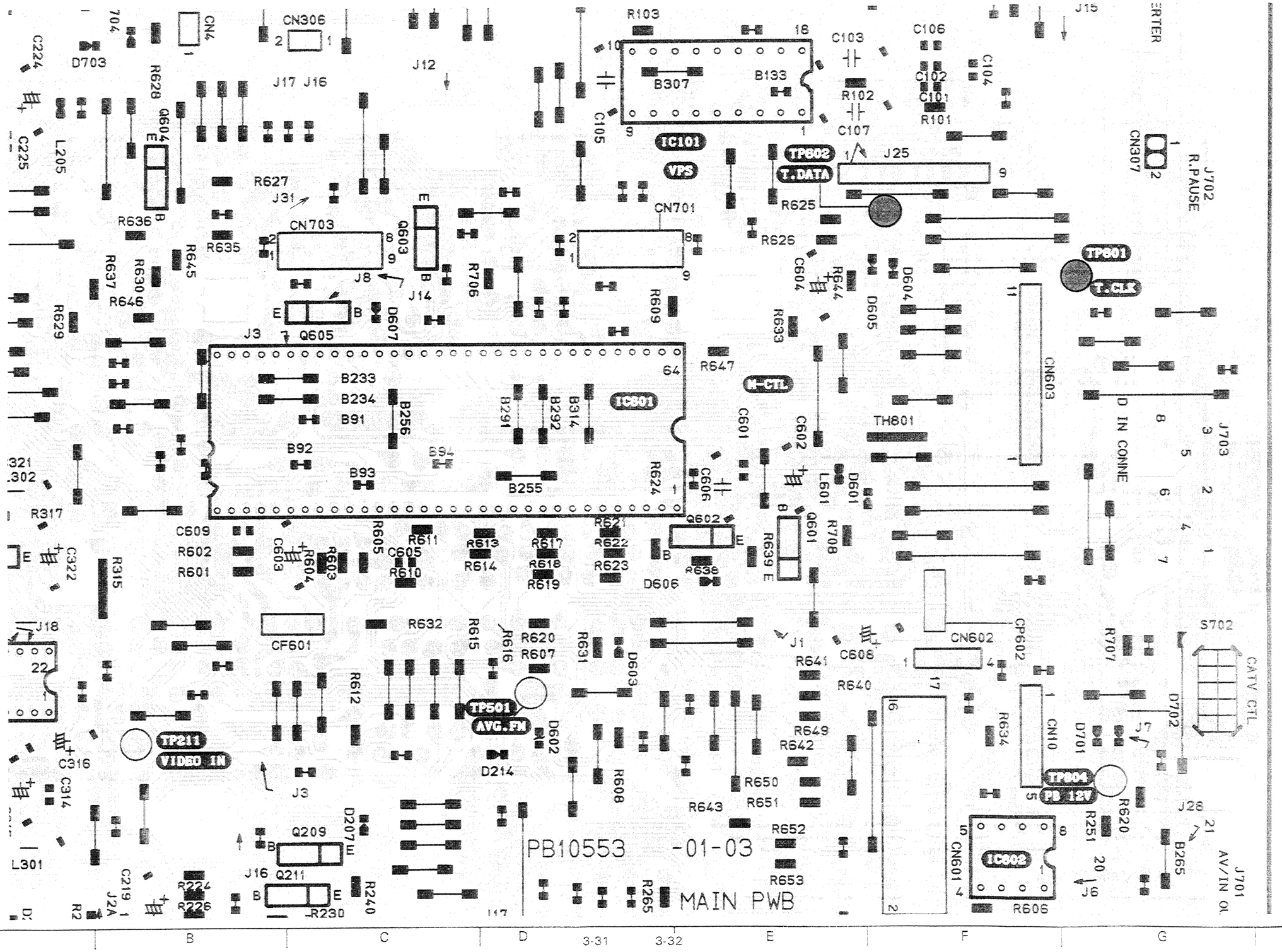
3.15 SYSTEM CTL SCHEMATIC DIAGRAM



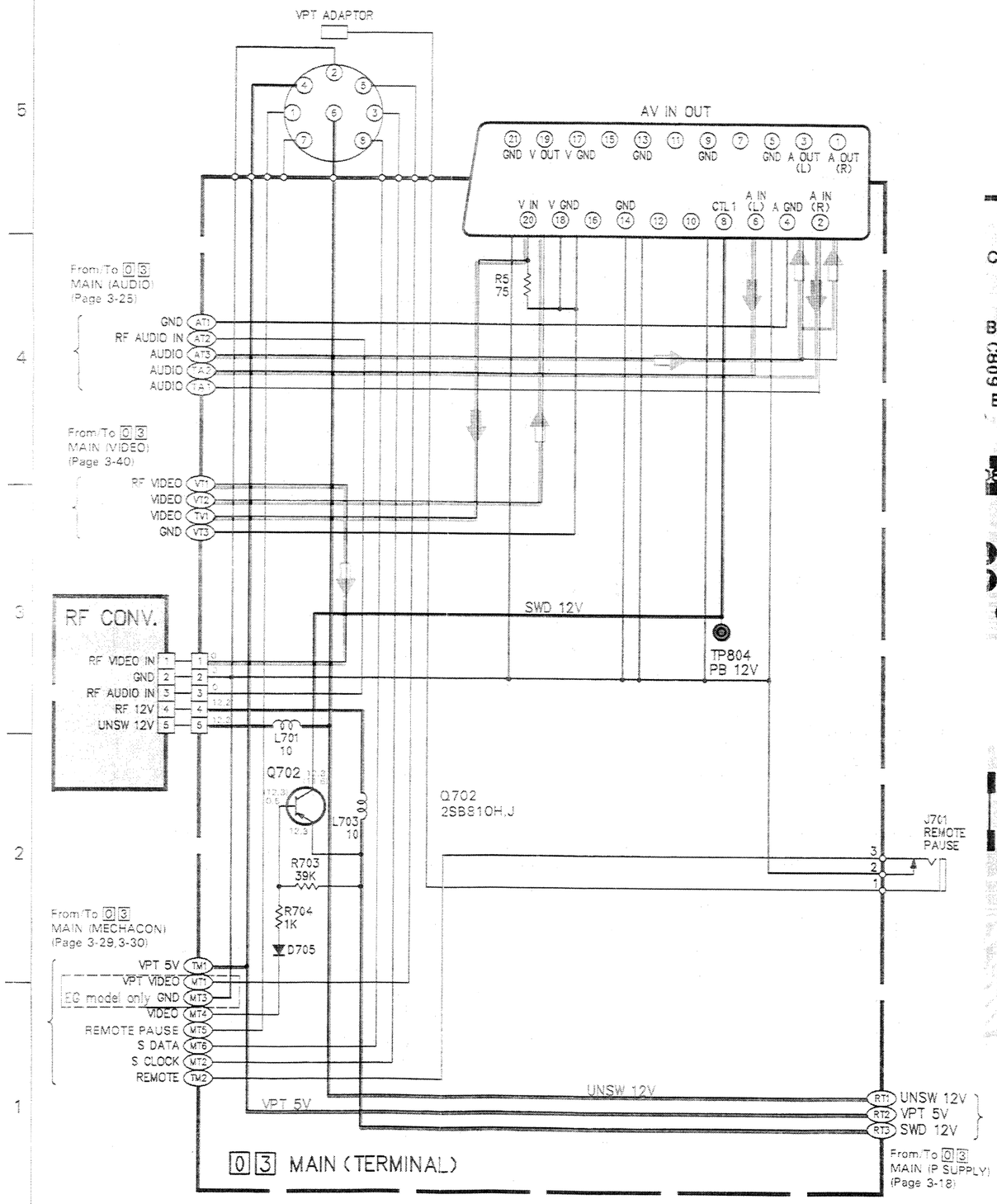
3.16 MECHACON (MAIN) CIRCUIT BOARD

• MAIN board assembly is located in page 37,38

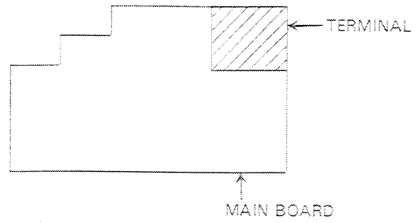




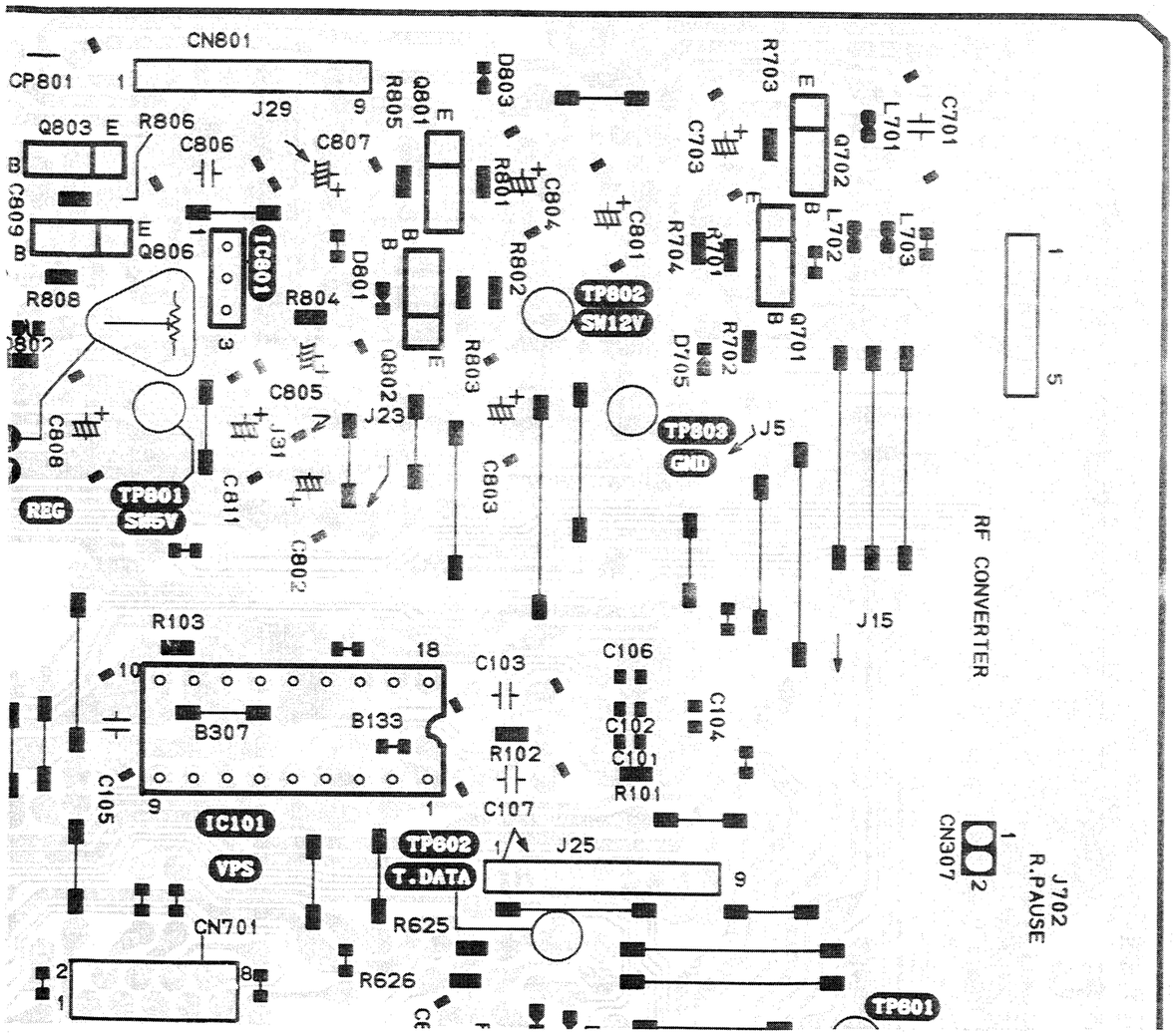
3.17 TERMINAL SCHEMATIC DIAGRAM



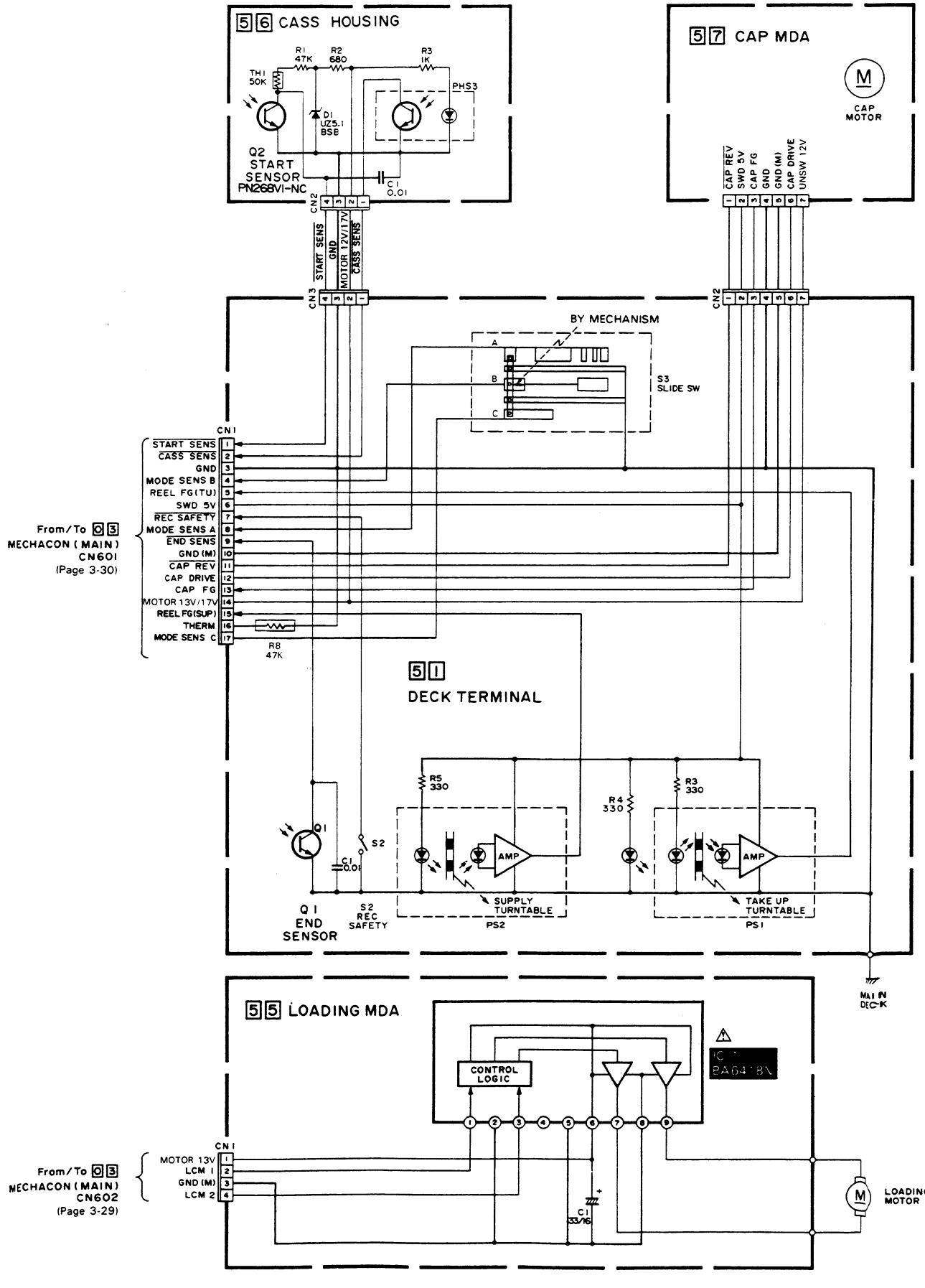
3.18 TERMINAL (MAIN) CIRCUIT BOARD



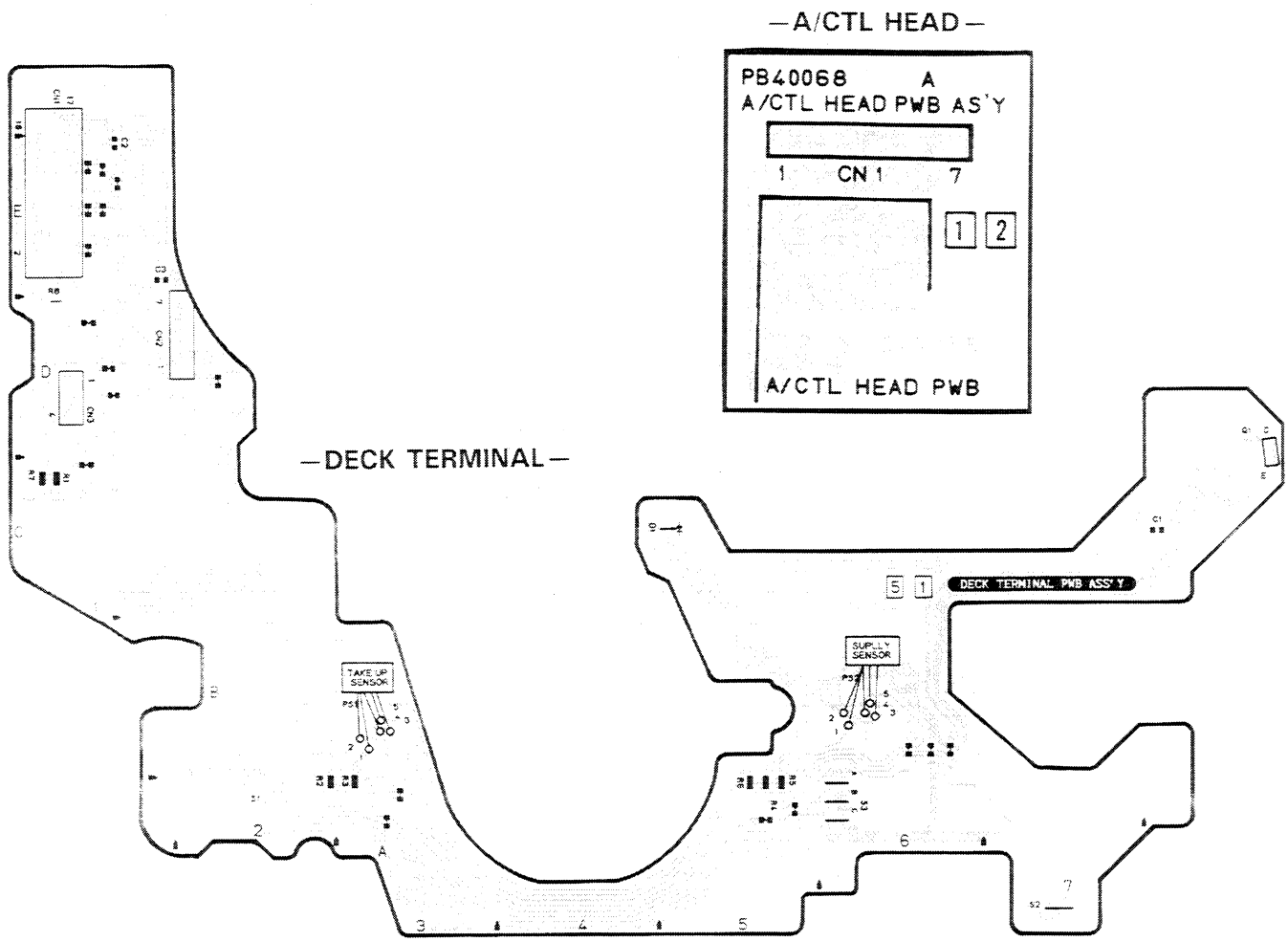
• MAIN board assembly is located in page 37,38

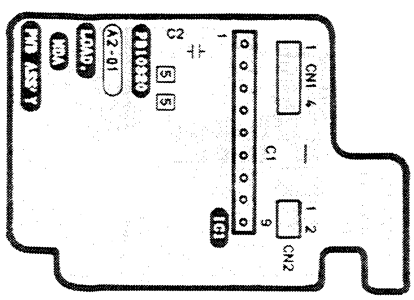


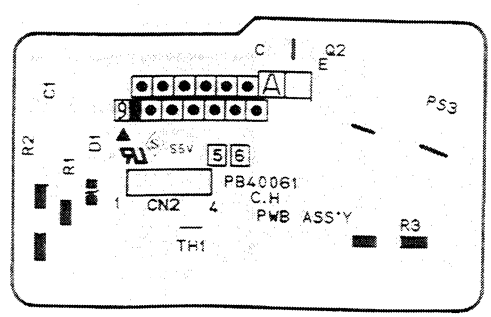
3.19 DECK TERMINAL, MODE MOTOR, CAPSTAN MDA AND CASS. HOUSING SCHEMATIC DIAGRAMS



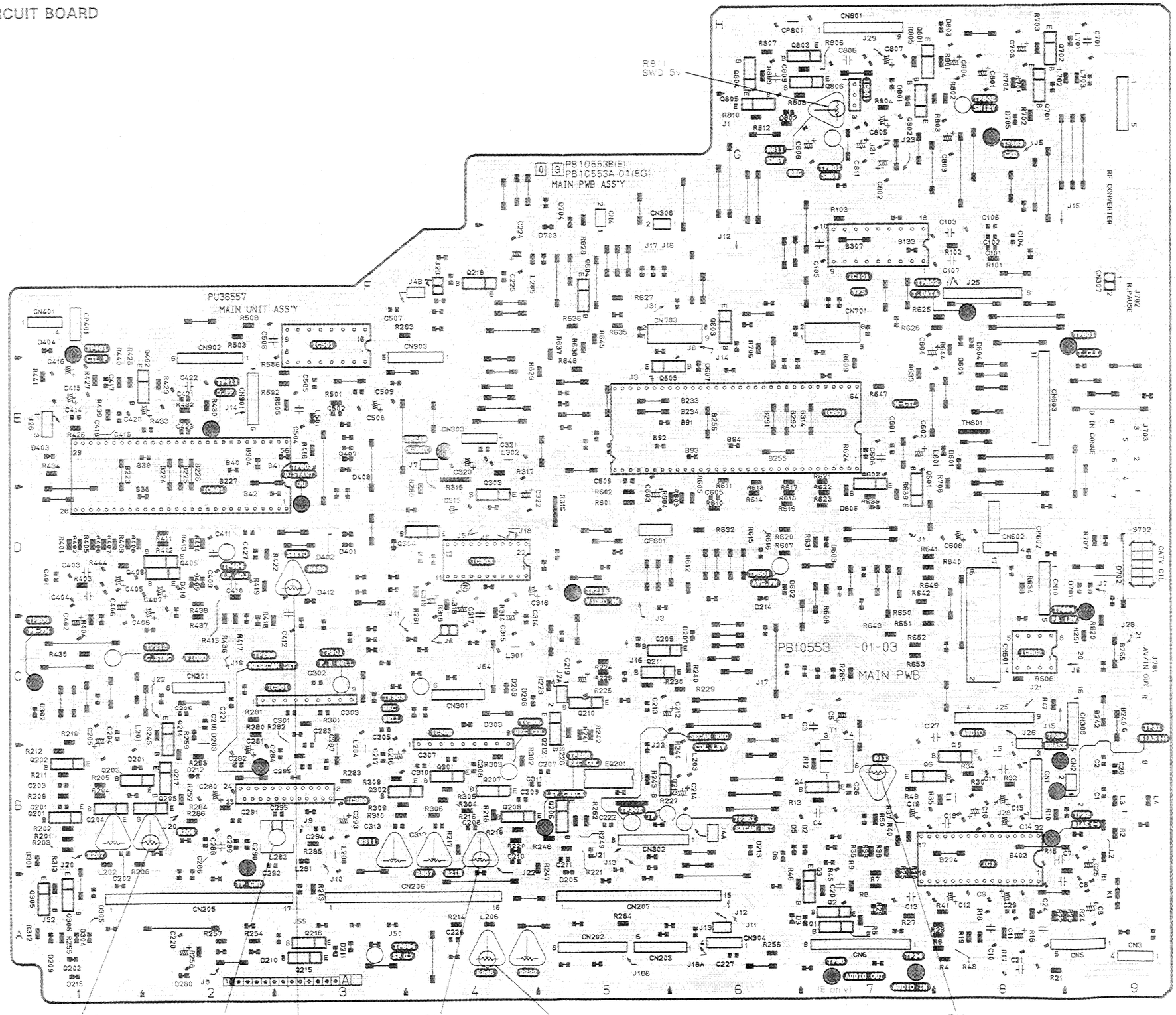
3.20 DECK TERMINAL, LOADING MDA, CASS. HOUSING AND A/CTL HEAD CIRCUIT BOARDS





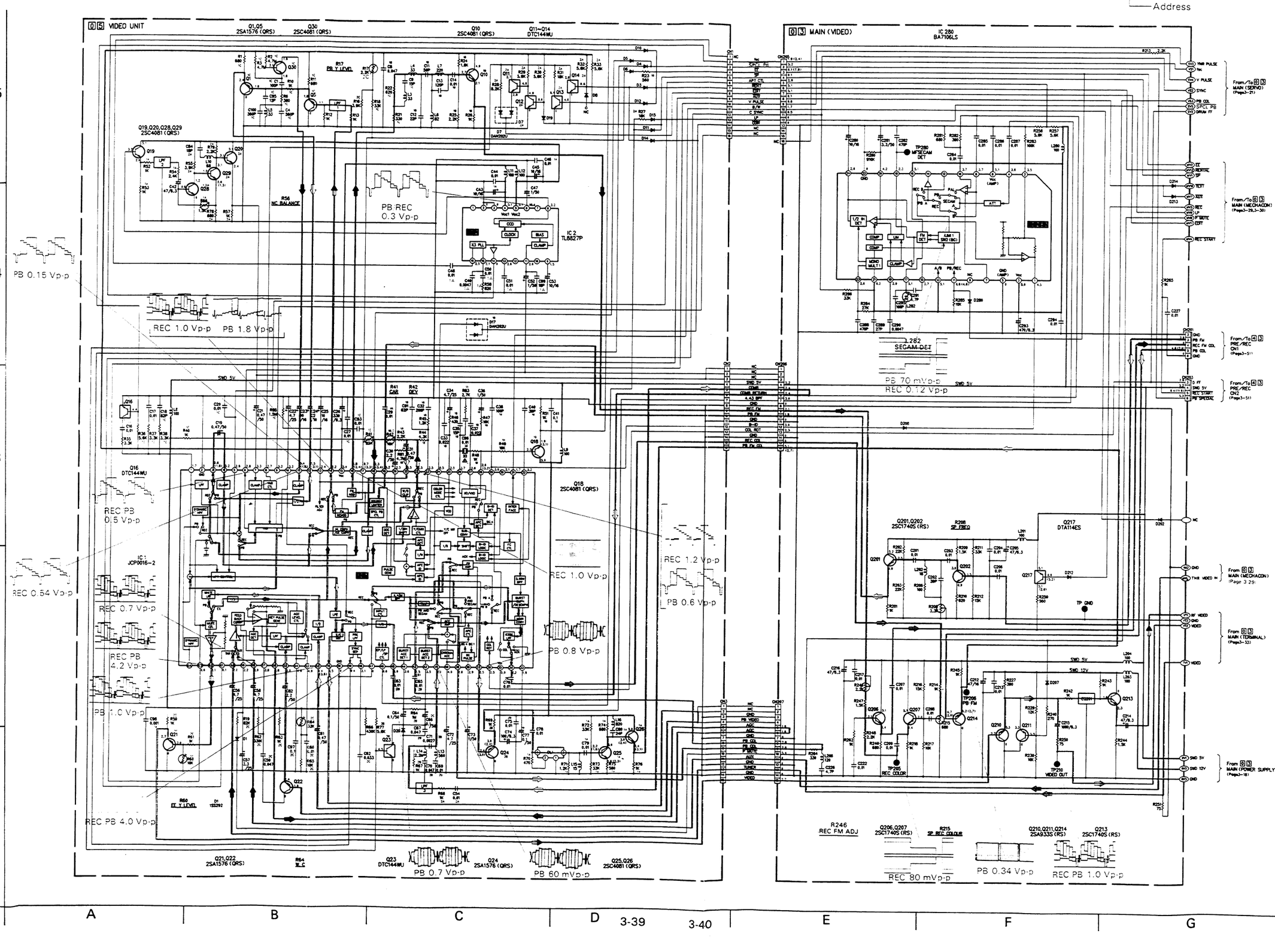


3.21 MAIN CIRCUIT BOARD



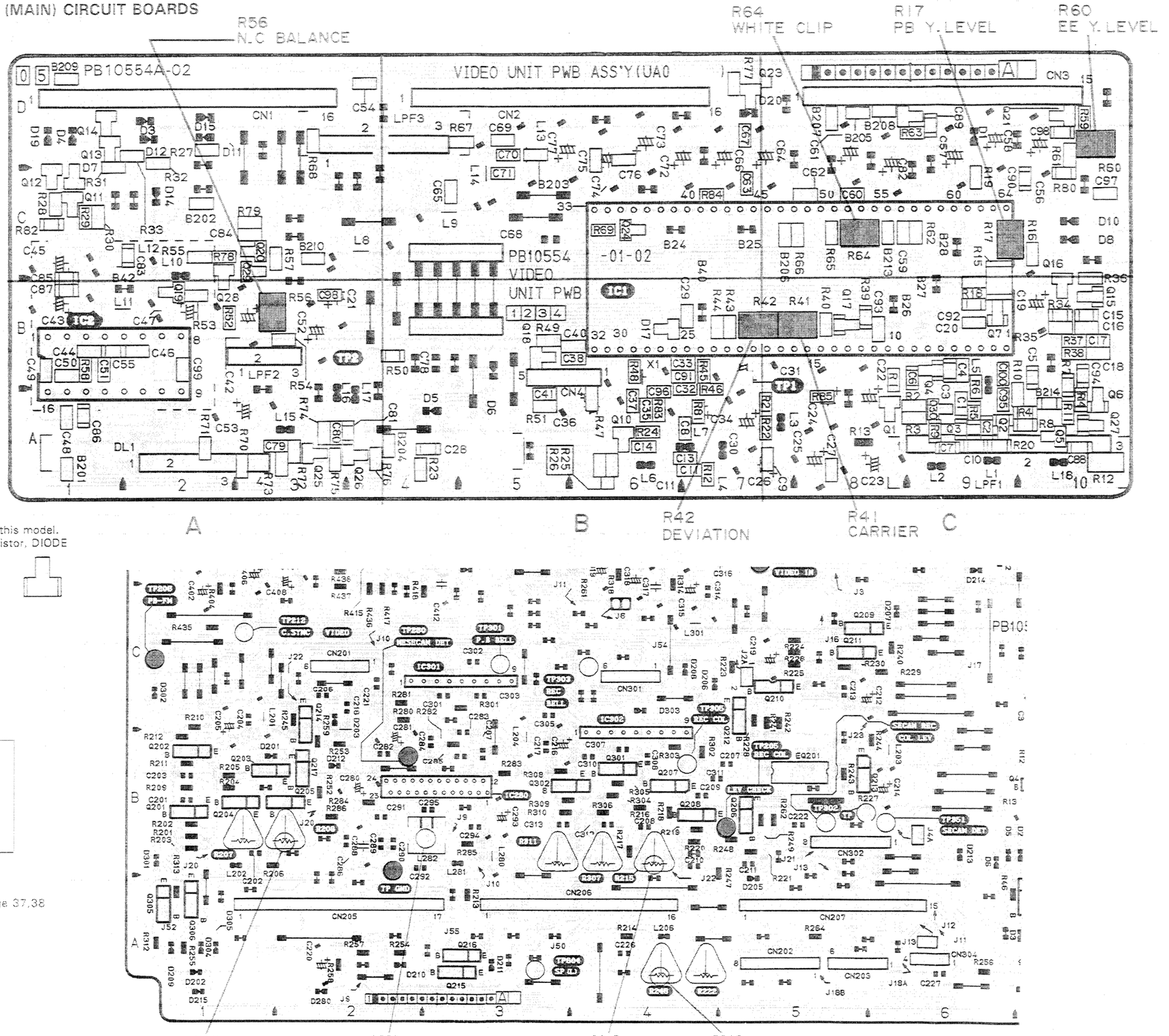
3.22 VIDEO UNIT & VIDEO (MAIN) SCHEMATIC DIAGRAMS

• Address of chip parts
1D
└ Address



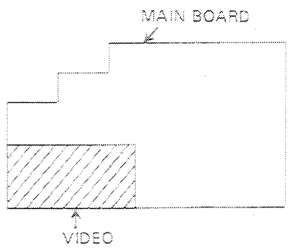
3.23 VIDEO UNIT & VIDEO (MAIN) CIRCUIT BOARDS

—VIDEO UNIT—



Note: Double edging indicates not used in this model.
Examples; Resistor, Capacitor, Transistor, DIODE

—VIDEO—

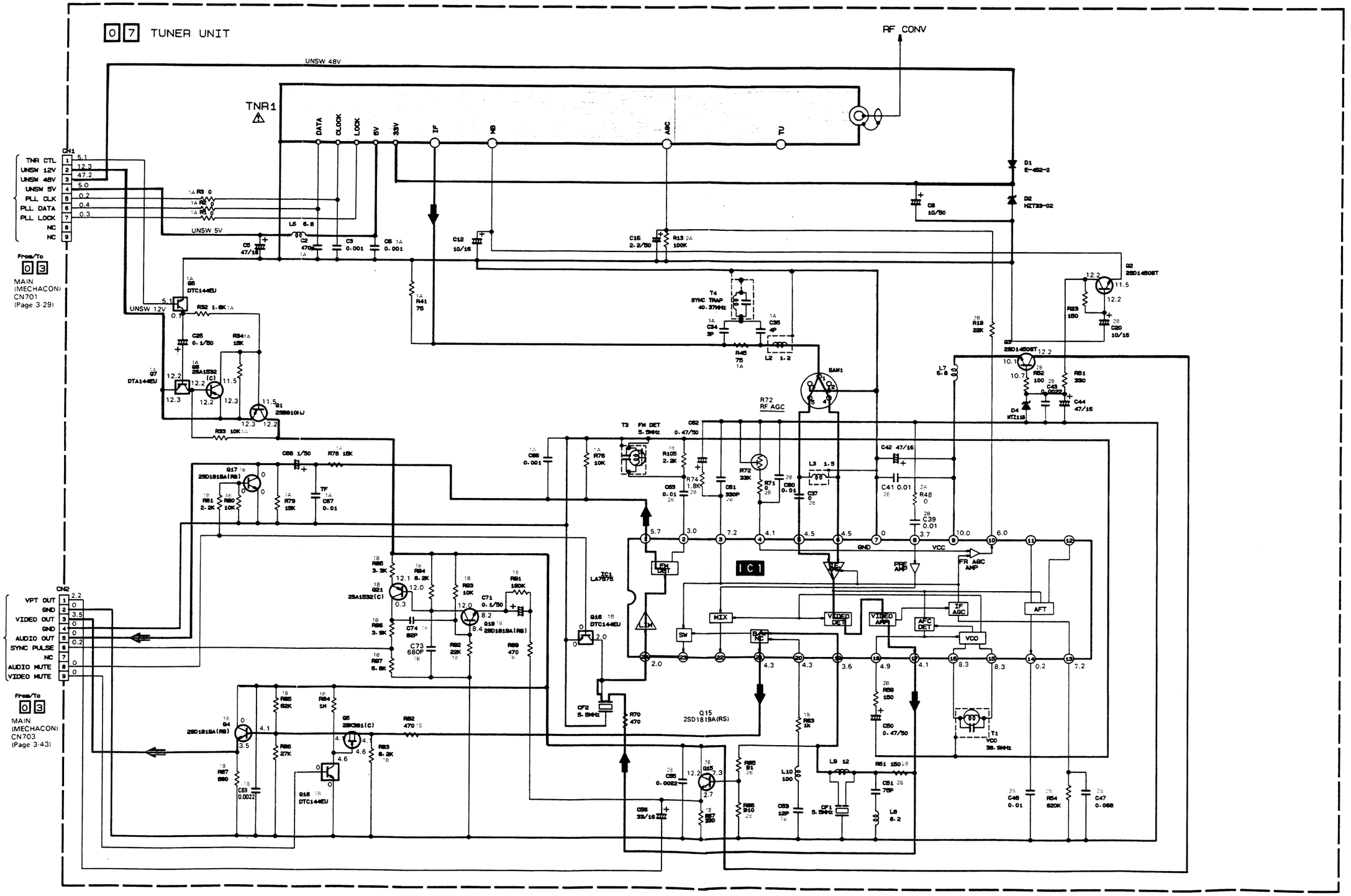


• MAIN board assembly is located in page 37,38

3.24 TUNER UNIT SCHEMATIC DIAGRAM

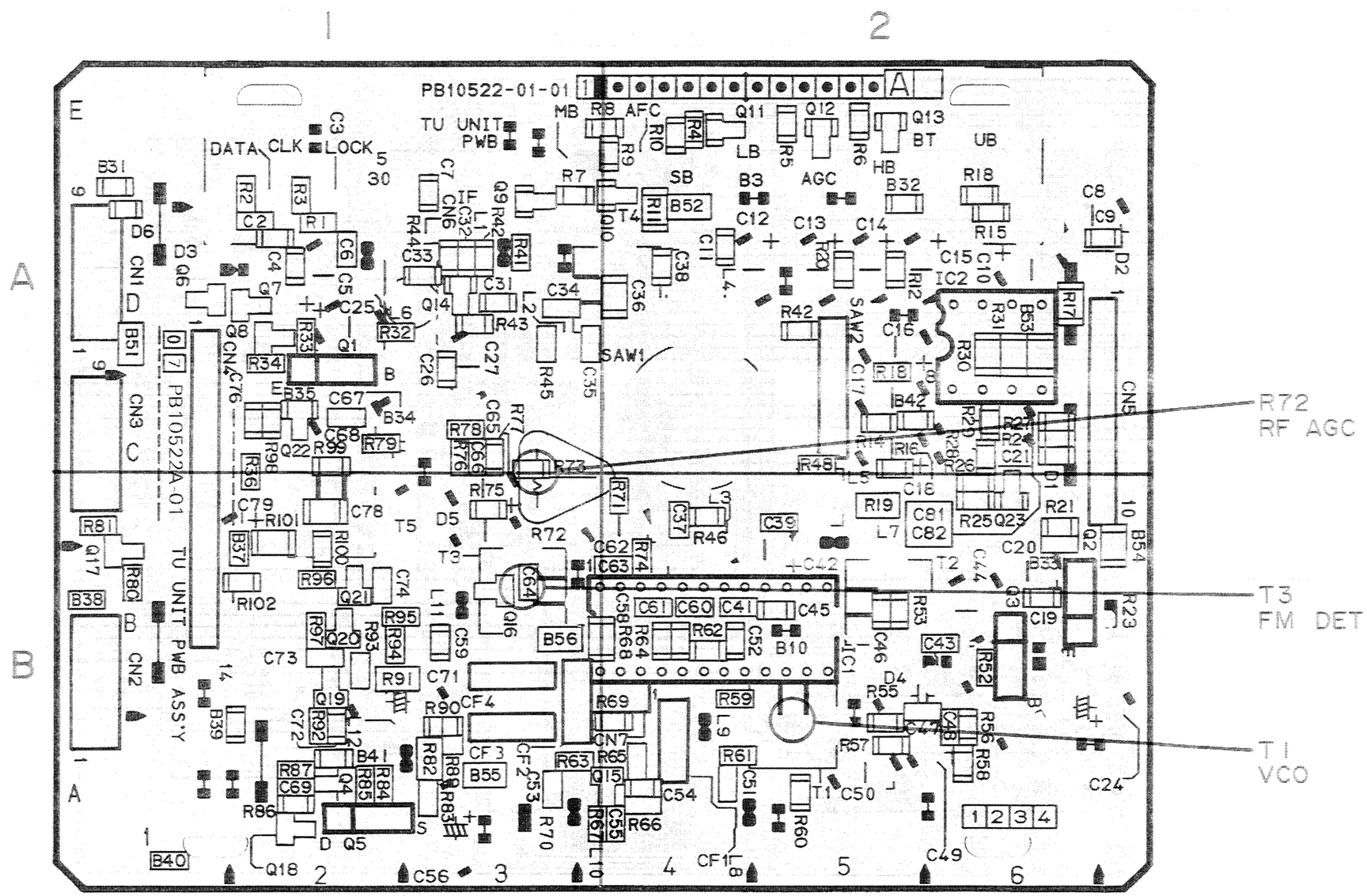
• Address of chip parts
1D
└ Address

NOTE: Voltages are DC-measured with a digital voltmeter during stop and tuner mode.



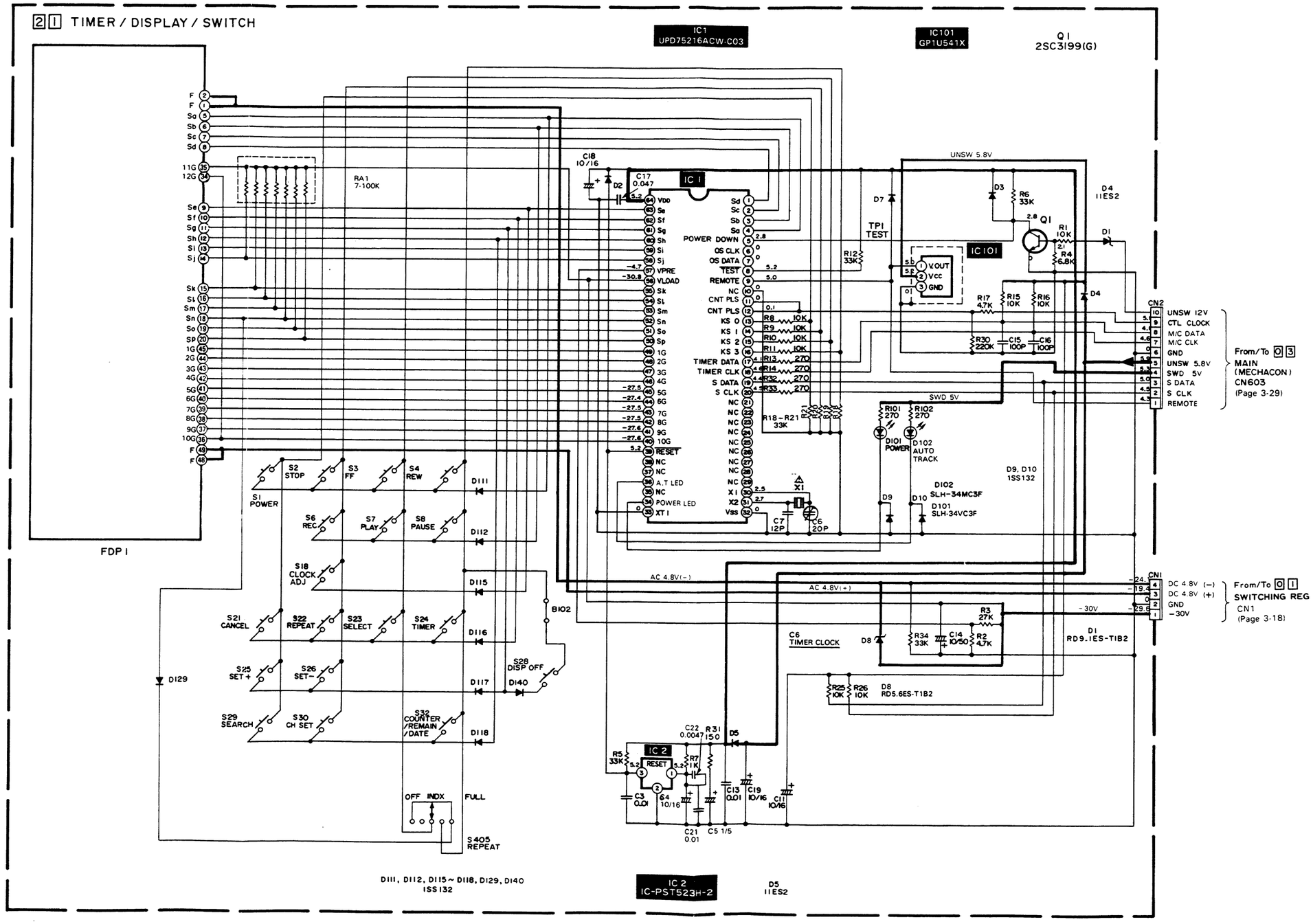
3-43 3-44

3.25 TUNER UNIT CIRCUIT BOARD



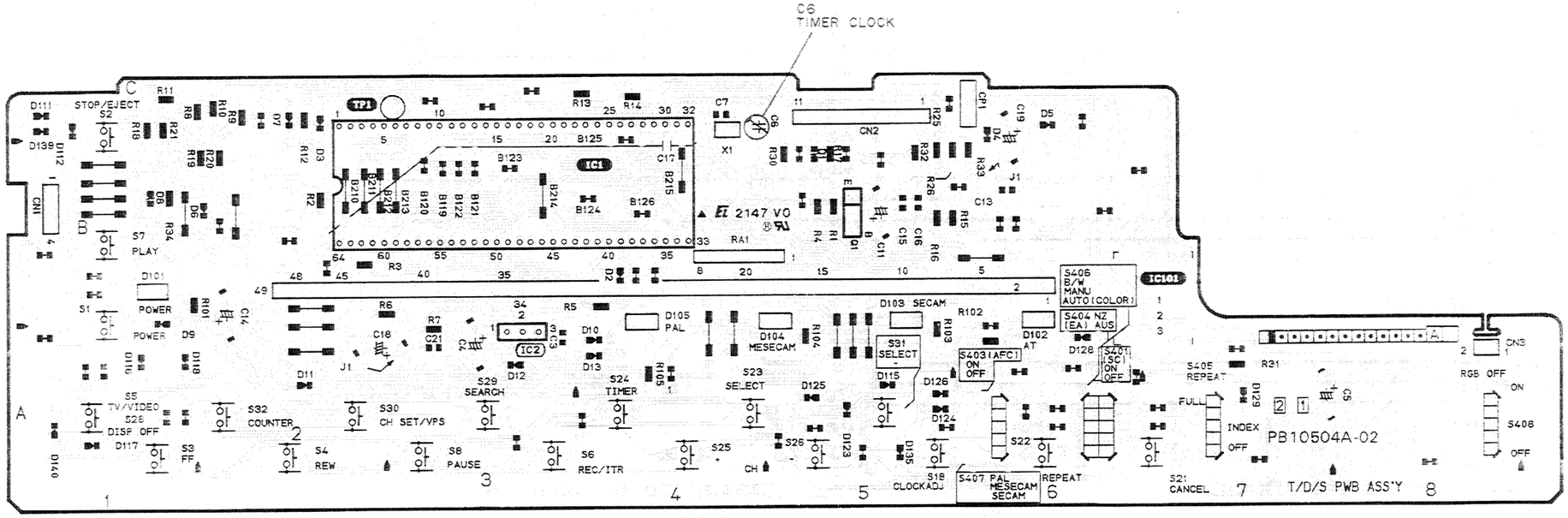
Note: Double edging indicates not used in this model.
Examples; Resistor, Capacitor, Transistor, DIODE

3.26 TIMER/DISPLAY/SW SCHEMATIC DIAGRAM

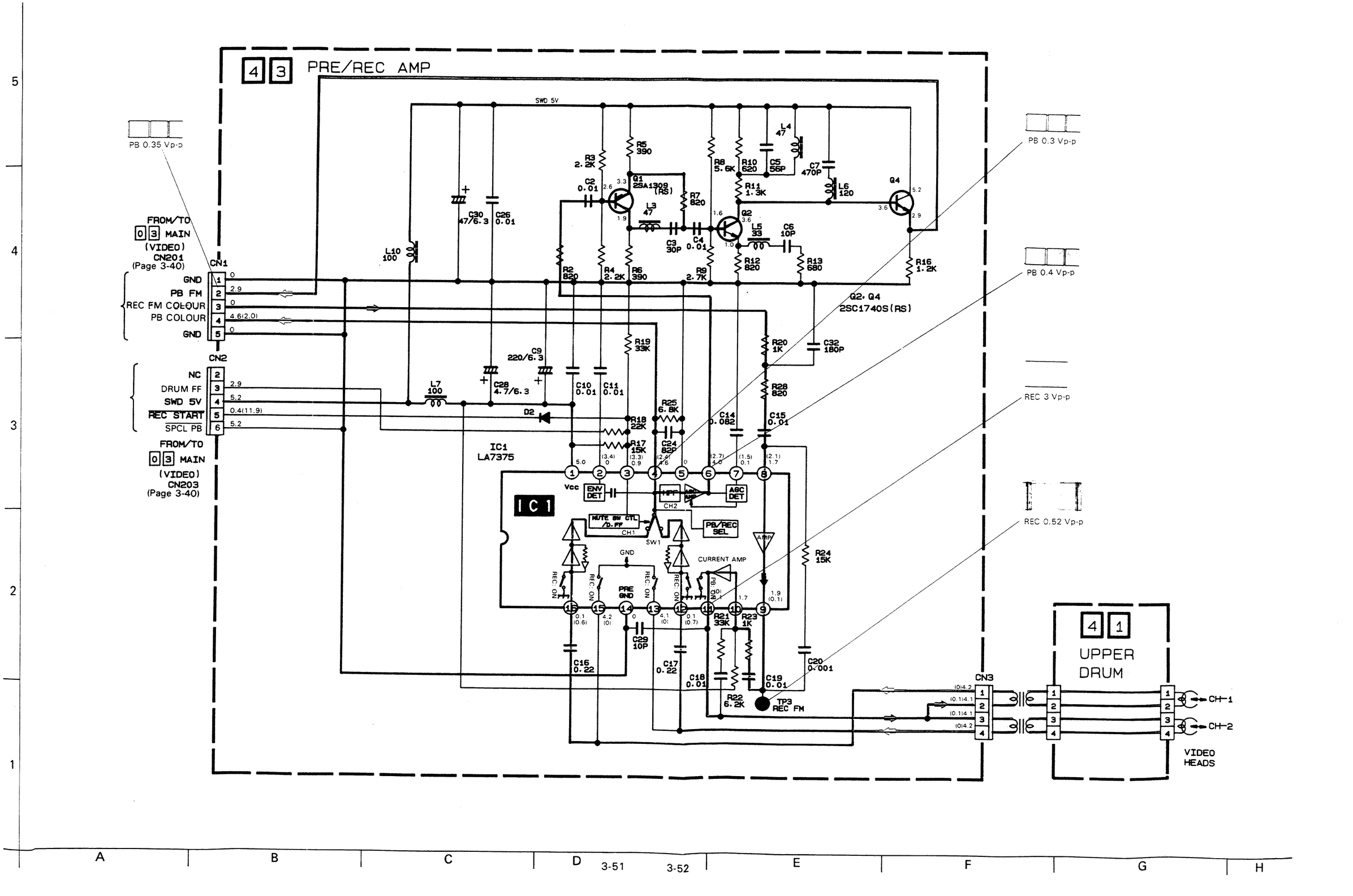


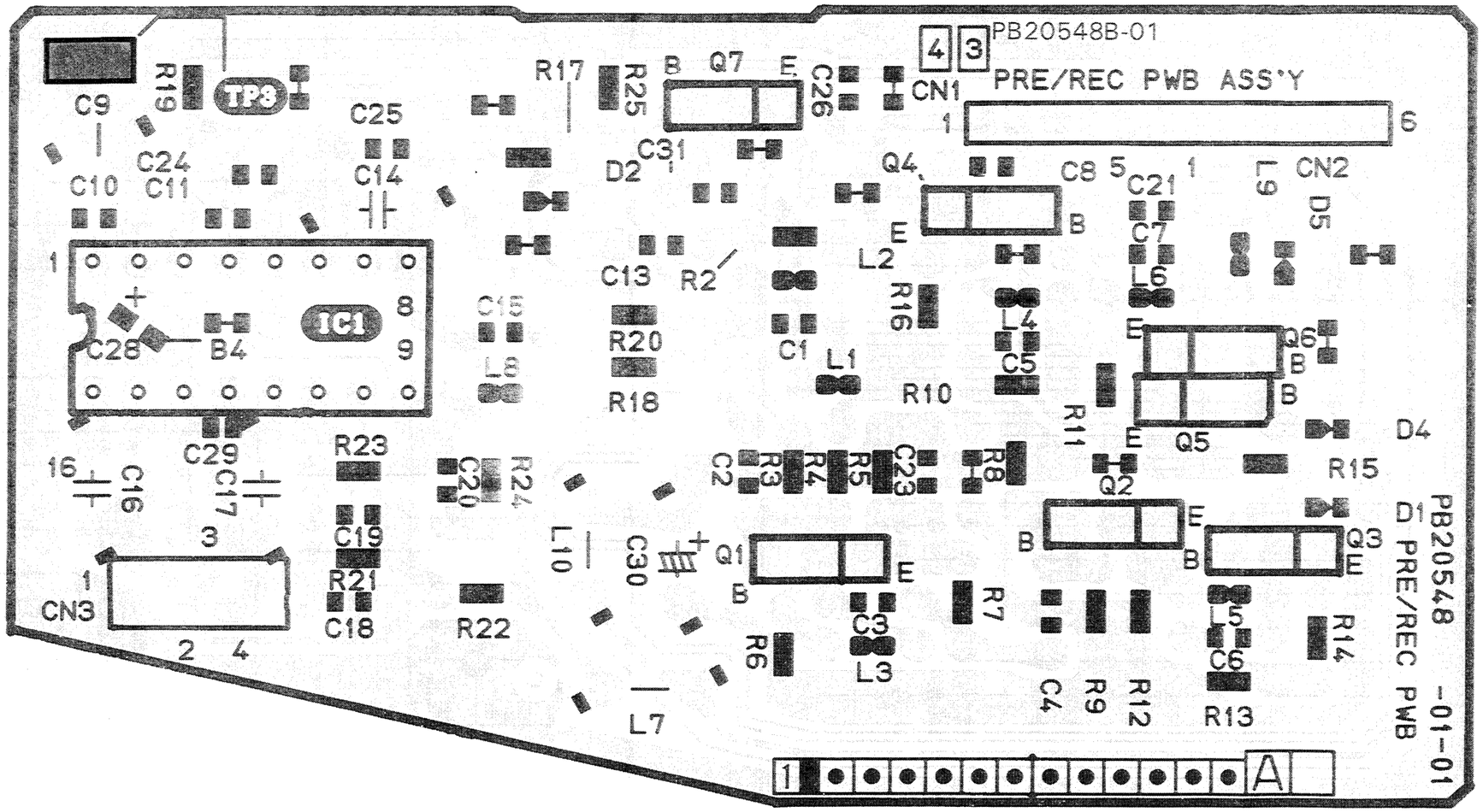
NOTE: Voltages are DC-measured with a digital voltmeter during stop and tuner mode.

3.27 TIMER/DISPLAY/SW CIRCUIT BOARD



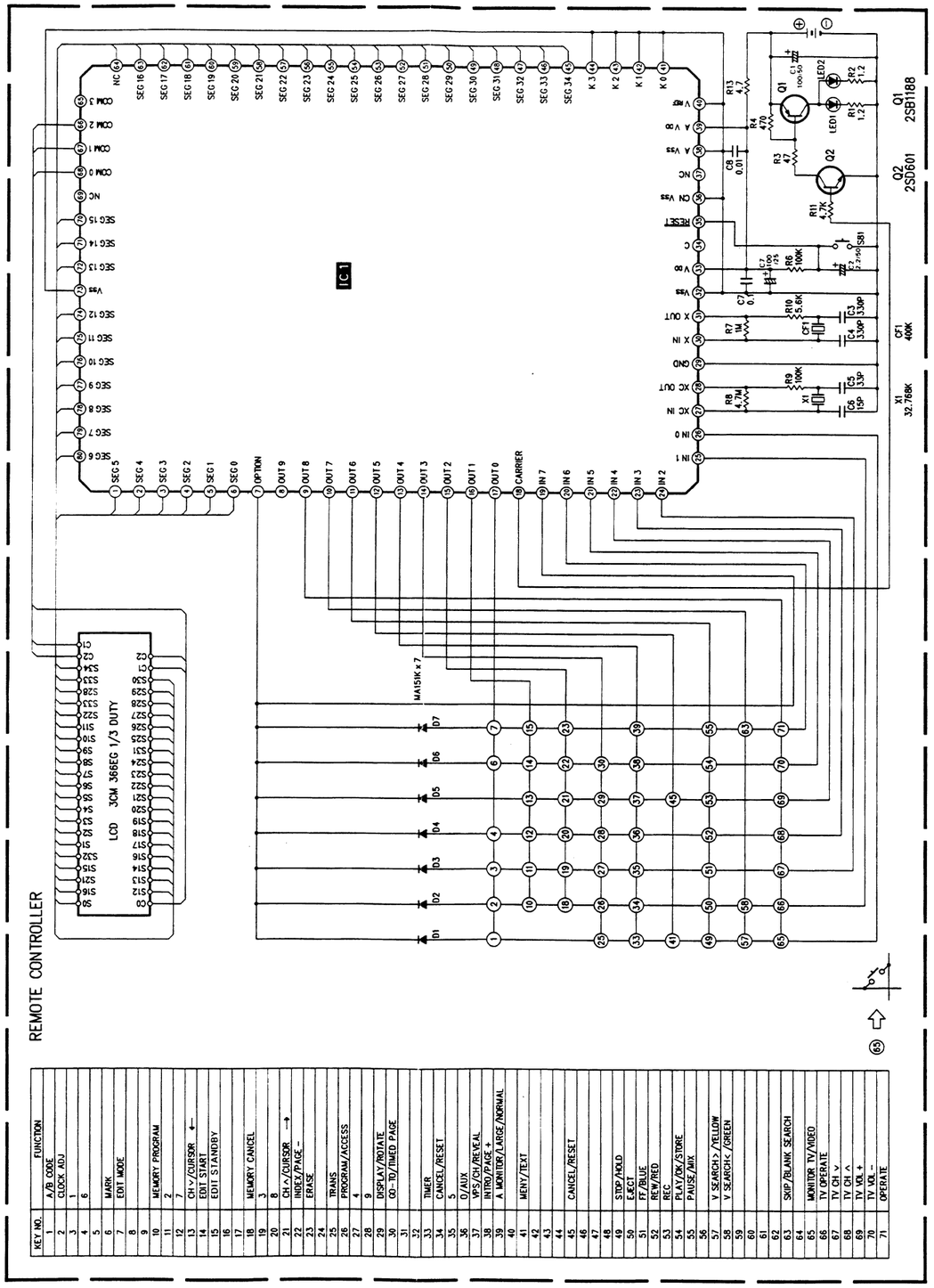
3.28 PRE/REC SCHEMATIC DIAGRAM




PB20548B-01
PRE/REC PWB ASS'Y
PB20548 -01-01
D1 PRE/REC PWB
CN1
CN2
CN3
IC1
TP3
Q1
Q2
Q3
Q4
Q5
Q6
Q7
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C13
C14
C15
C16
C17
C18
C19
C20
C21
C23
C24
C25
C26
C28
C29
C30
C31
L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
D2
D4
D5
B4

3.30 REMOTE CONTROL SCHEMATIC DIAGRAM

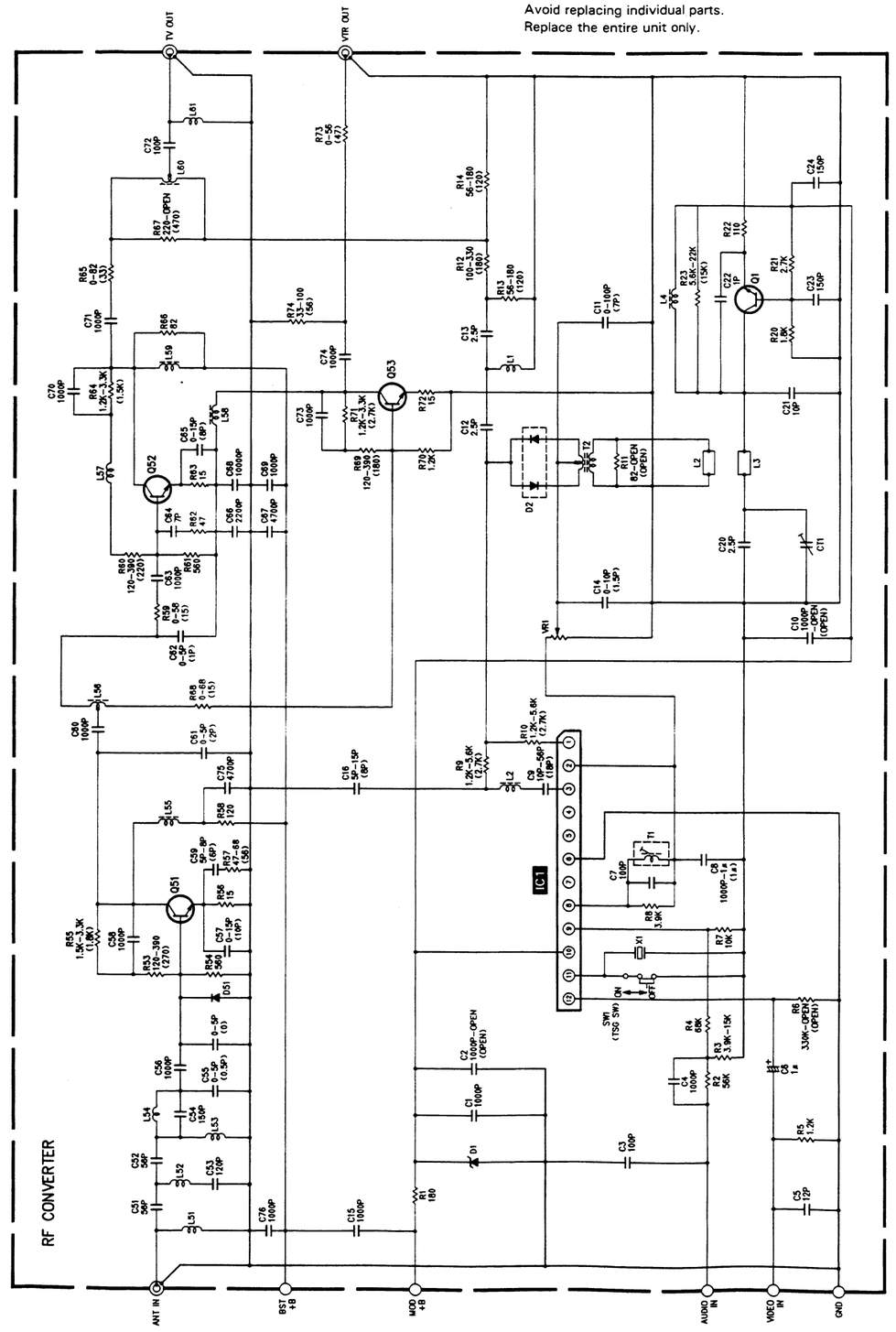
Note:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.



KEY NO.	A/B CODE	FUNCTION
1		
2	CLOCK ADJ	
3	1	
4		
5	6	
6	MARK	
7	EDIT MODE	
8		
9		
10	MEMORY PROGRAM	
11	2	
12	7	
13	CH ∨/CURSOR ←	
14	EDIT START	
15	EDIT STANDBY	
16		
17		
18	MEMORY CANCEL	
19	3	
20	CH ∧/CURSOR →	
21	INDEX/PAGE+	
22	ERASE	
23		
24		
25	TRANS	
26	PROGRAM/ACCESS	
27	4	
28	9	
29	DISPLAY/ROTATE	
30	CO-TD/TIMED PAGE	
31		
32		
33	TIMER	
34	CANCEL/RESET	
35	5	
36	0/AUX	
37	WPS/CH.REVEAL	
38	INTRO/PAGE-	
39	A.MONITOR/LARGE/NORMAL	
40		
41	MENY/TEXT	
42		
43		
44		
45	CANCEL/RESET	
46		
47		
48		
49	STOP/HOLD	
50	EJECT	
51	FF/BLUE	
52	REW/RED	
53	REC	
54	PLAY/OK/STORE	
55	PAUSE/MIX	
56		
57	V SEARCH> /YELLOW	
58	V SEARCH< /GREEN	
59		
60		
61		
62		
63	SKIP/BLANK SEARCH	
64		
65	MONITOR TV/VIDEO	
66	TV OPERATE	
67	TV CH ∨	
68	TV CH ∧	
69	TV VOL +	
70	TV VOL -	
71	OPERATE	

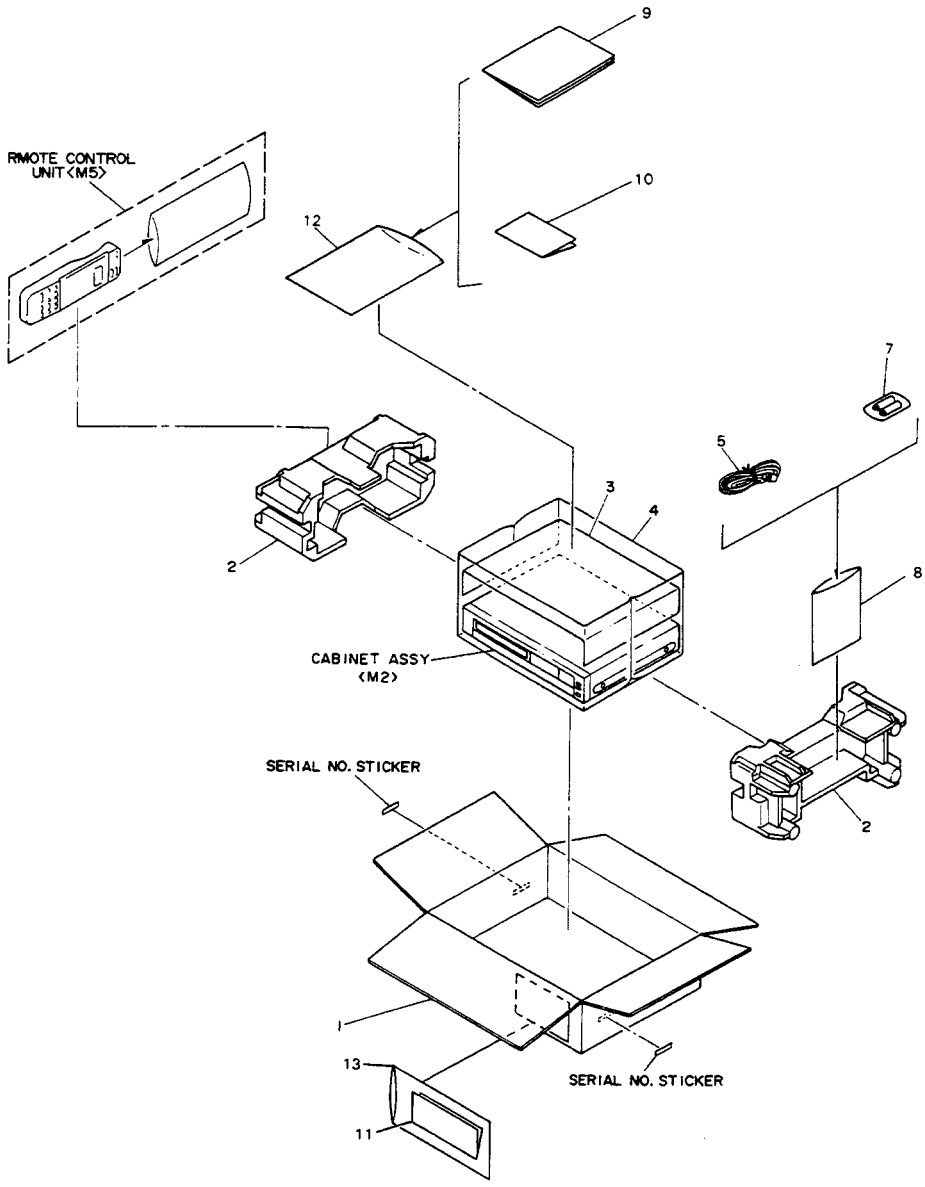
3.31 RF CONVERTER SCHEMATIC DIAGRAM

Note:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.



SECTION 4
EXPLODED VIEWS AND PARTS LIST

4.1 PACKING ASSEMBLY <M1>



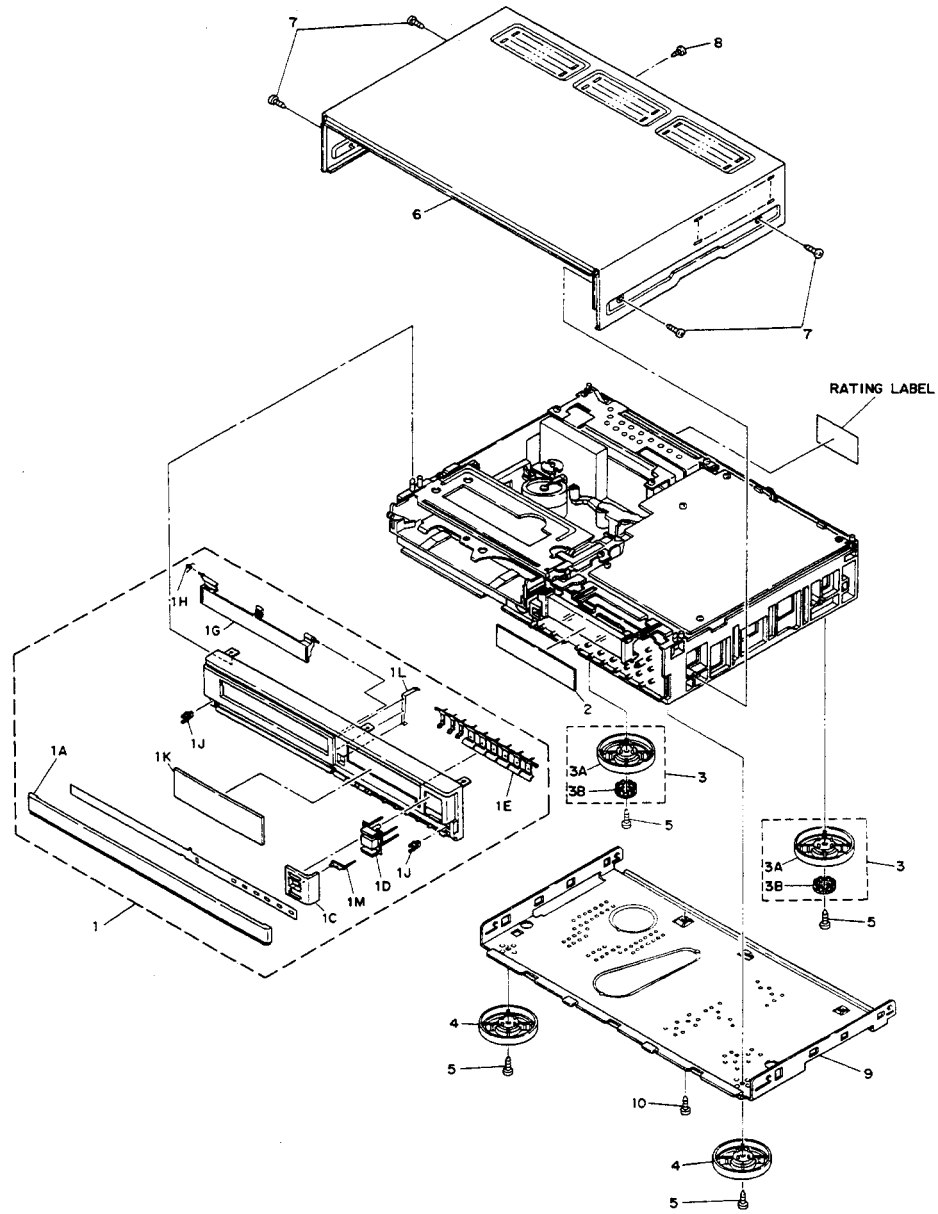
⚠	REF. No.	PART No.	PART NAME, DESCRIPTION

****

PACKING ASSEMBLY <M1>

1	PQ33868	PACKING CASE,EG
	PQ33868-2	PACKING CASE,E
2	PQ33869A-1	CUSHION ASSY
3	PQ41026-8	PROTECT SHEET
4	PQM30021-59-11	POLY BAG
5	PU59168-3	RF CABLE
	or PU59167-3	RF CABLE
7	UM-3DJ2P	BATTERY, x 2
8	QPGA020-02005	POLY BAG
⚠ 9	PU30425-1213	INSTRUCTIONS,E
⚠	PU30425-1206	INSTRUCTIONS,EG
10	TCN-3379	TAPE CATALOG
11	BT-20114	WARRANTY CARD,EG
12	QPGA025-03505	POLY BAG
13	PQ33909	POLY BAG,EG

4.2 CABINET ASSEMBLY <M2>



⚠	REF. No.	PART No.	PART NAME, DESCRIPTION

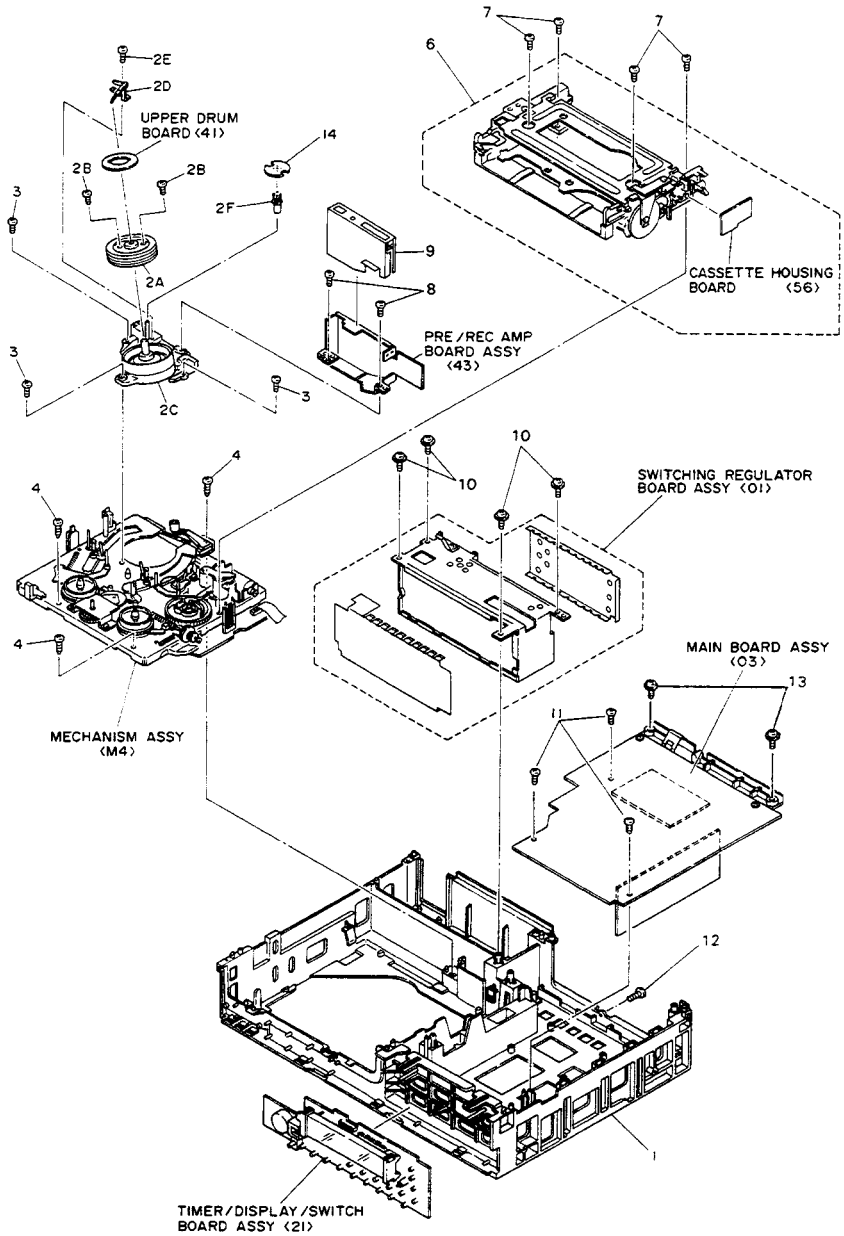
****

CABINET ASSEMBLY <M2>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	1	PQ11071B-5	FRONT PANEL ASSY,EG
⚠		PQ11071C-5	FRONT PANEL ASSY,E
	1A	PQ21128B-3	DOOR ASSY, EG
		PQ21128C-3	DOOR ASSY, E
	1C	PQ21213-1-2	COVER
	1D	PQ21214-1-1	BUTTON(COVER)
	1E	PQ21126-2	BUTTON
	1G	PQ21125-2	CASSETTE DOOR,EG
		PQ21125-3	CASSETTE DOOR,E
	1H	PQ45165	TORSION SPRING
	1J	PU60109	CATCHER, ×2
⚠	1K	PQ33764	WINDOW
	1L	PQ33911	PLATE(EARTH)
	1M	PQ45105-1-1	INDICATOR
	2	PQ45198	FILTER(FDP)
	3	PQ33012D	FOOT ASSY, ×2
	3A	PQ33013-4	FOOT(1)
	3B	PQ33014	FOOT(2)
	4	PQ33013-4	FOOT(1), ×2
	5	SDSF3010Z	SCREW, ×4 FOR FOOT
⚠	6	PQ11144	TOP COVER
	7	PQ43827	SPECIAL SCREW, ×4 FOR TOP COVER
	8	SDSF3010M	SCREW,FOR TOP COVER
⚠	9	PQ11145	BOTTOM COVER
	10	SDSF3010Z	SCREW,FOR BOTTOM COVER

4.3 CHASSIS ASSEMBLY <M3>

BEWARE OF BOGUS PARTS
Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.

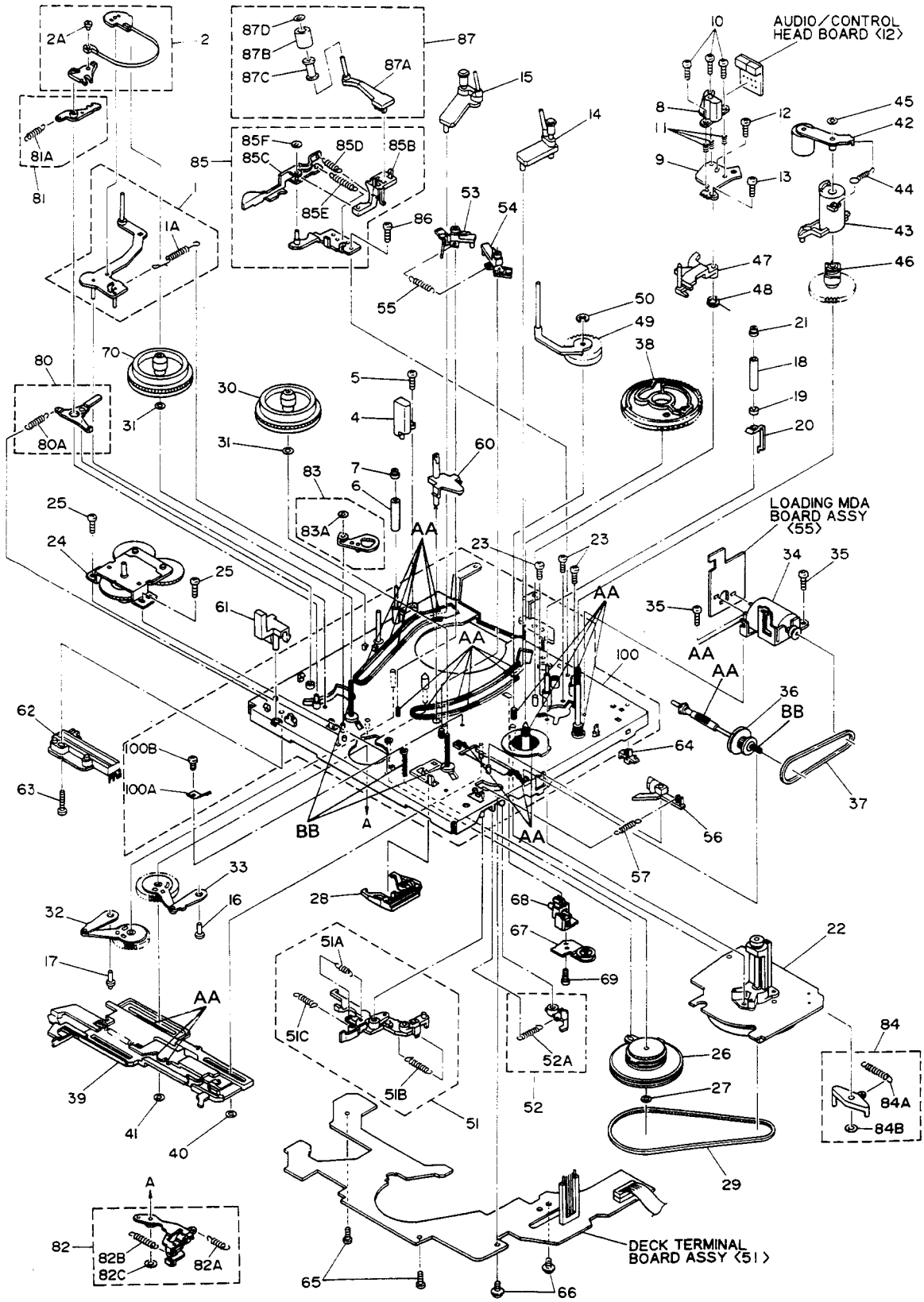


⚠	REF. No.	PART No.	PART NAME, DESCRIPTION

CHASSIS ASSEMBLY <M3>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	1	PQ11060	BOTTOM CHASSIS
⚠	2A	PDM2008B-5	UPPER DRUM ASSEMBLY
	2B	PDM4165A	DRUM SCREW ASSEMBLY, ×2
⚠	2C	PDM2138G	LOWER DRUM MOTOR ASSEMBLY
	2D	PDM4229A-1	BRUSH ASSY
	2E	SPSG2606Z	SCREW,FOR BRUSH ASSEMBLY
	2F	PDM4226A	ROLLER ASSY
	3	SPST2610Z	SCREW, ×3 FOR DRUM ASSY
	or	SDST2610Z	SCREW, ×3 FOR DRUM ASSY
	4	PQ43831	SPECIAL SCREW, ×3 FOR MAIN DECK
	6	PUS29183D-2	CASSETTE HOUSING ASSY
	7	SDST2608Z	SCREW, ×4 FOR CASSETTE HOUSING
	or	SPST2608Z	SCREW, ×4 FOR CASSETTE HOUSING
	8	SDSG2606Z	SCREW, ×2 FOR PRE/REC BOARD
	9	PQ32217-1-1	SHIELD CASE(2),FOR P/R BOARD
	10	GPSF2610Z	SCREW, ×4 FOR SW REG BOARD
	11	SDSF2608Z	SCREW, ×3 FOR MAIN BOARD
	12	SDSF3010M	SCREW,FOR TERMINAL BOARD
	13	GPSF2610Z	SCREW, ×2 FOR TERMINAL BOARD
	14	PQ45160	INERTIA PLATE

4.4 MECHANISM ASSEMBLY <M4>



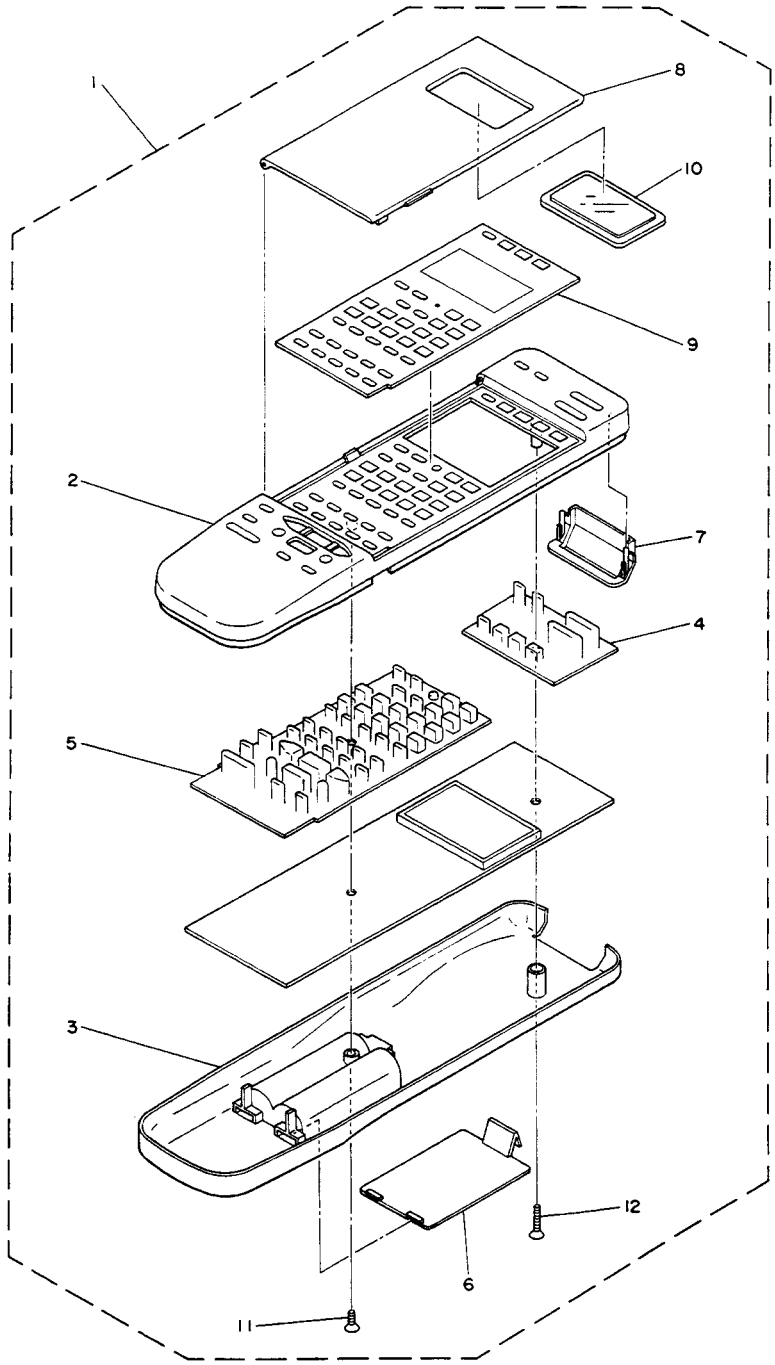
Category	Part number	MARK
Grease	KANTO-G-31KAV	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

MECHANISM ASSEMBLY <M4>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ43497E-10	TENSION ARM ASSY
	1A	PQ43500	TENSION SPRING
	2	PQ44734A-5	TENSION BAND ASSY
	2A	PQ44737-2	ADJUST PIN
	4	PU60616	FULL ERASE HEAD
	5	SDSF2614Z	SCREW
	6	PQ43505-1-1	ROLLER
	7	PQ43506	GUIDE POLE CAP
	8	PU61002	AUDIO/CONTROL HEAD
	9	PQ43509	HEAD BASE
	10	PQ43687A	SPECIAL SCREW, ×3
	11	PQM30002-192	COMPRESSION SPRING, ×3
	12	SPSF2608M	SCREW
	13	SPSP2606Z	SCREW
	14	PU61103-2	POLE BASE(TU) ASSY
	15	PU61151-2-3	POLE BASE(SUP) ASSY
	16	PQ43524	STOPPER
	17	PQ43525	STOPPER 2
	18	PQ43526-1-3	TAPE GUIDE
	19	PQ43670-1-1	GUIDE FLANGE
	20	PQ43675	TAPE GUARD
	21	PQ43506	GUIDE POLE CAP
⚠	22	PU61003-1-2	CAPSTAN MOTOR
	23	SPSG2608Z	SCREW, ×3
	24	PU61246	IDLER GEAR UNIT
	25	SPST2606Z	SCREW, ×2
	26	PU61245-1-1	CLUTCH UNIT
	27	PQM30017-8	SLIT WASHER
	28	PQ43532B	CHANGE LEVER ASSY
	29	PU61006	TIMING BELT
	30	PU60858-1-4	REEL DISK (TAKE-UP)
	31	PQM30018-54	SPACER, ×2
	32	PQ43537A	LOADING ARM ASSY (SUPLLY)
	33	PQ43542B	LOADING ARM ASSY (TAKE-UP)
⚠	34	PQ43676B-5	MODE MOTOR ASSY
⚠	or	PQ43676C	MODE MOTOR ASSY
	35	SPST2606Z	SCREW, ×2
	36	PQ43548A-3	WORM CLUTCH ASSY
	37	PQM30003-23	BELT
	38	PQ20822-2-4	CONTROL CAM
	39	PQ44581A-6	PLATE ASSY
	40	PQM30017-12	SLIT WASHER
	41	PQM30017-8	SLIT WASHER
	42	PQ43558A	PINCH ROLLER ARM ASSY
	or	PQ43558B	PINCH ROLLER ARM ASSY
	43	PQ32415	PINCH ROLLER PRESS LEVER
	44	PQM30001-233	TENSION SPRING
	45	PQM30017-12	SLIT WASHER
	46	PQ32416-2	PINCH ROLLER CAM
	47	PQ43567A-8	GUIDE ARM ASSY
	48	PQ43569-1-3	TORSION SPRING
	49	PQ43570A-1	HALF LOADING GEAR ASSY
	50	PQM30017-12	SLIT WASHER
	51	PQ43575A-5	CANCEL LEVER ASSY
	51A	PQM30001-273	TENSION SPRING
	51B	PQM30001-237	TENSION SPRING
	51C	PQM30001-274	TENSION SPRING
	52	PQ43578A-2	HOOK ASSY
	52A	PQM30001-238	TENSION SPRING
	53	PQ43581C	MAIN BRAKE(SUPPLY) ASSY
	54	PQ43582B	MAIN BRAKE(TAKE-UP) ASSY
	55	PQM30001-251	TENSION SPRING
	56	PQ43583A	SUB BRAKE ASSY (TAKE-UP)
	57	PQM30001-298	TENSION SPRING
	60	PU60621-1-2	LED HOLDER
	61	PU60624-1-4	REC SAFETY SWITCH
	62	PU61247	SLIDE ENCORDER
	63	SDSF2614Z	SCREW
	64	PQ32516	PWB HOLDER
	65	SDST2616Z	SCREW, ×2
	66	GPSF2608Z	SCREW, ×2
	67	PQ43912A-7	PULLEY ARM ASSY
	68	PQ33249	PULLEY BASE
	69	PQ45121A	SCREW
	70	PU60859-1-4	REEL DISK (SUPPLY)
	80	PQ44739A-1	LOCK LEVER 1 ASSY
	80A	PQM30001-278-46	TENSION SPRING
	81	PQ44741A-3	L.LEVER 2 ASSY
	81A	PQM30001-279-52	TENSION SPRING
	82	PQ44743A-5	IDLER LEVER ASSY
	82A	PQM30001-302	TENSION SPRING
	82B	PQM30001-301	TENSION SPRING
	82C	PQM30017-5	SLIT WASHER
	83	PQ44746A-2	OFF LEVER ASSY
	83A	PQM30017-5	SLIT WASHER
	84	PQ44585A-6	CAP.BRAKE ASSY
	84A	PQM30001-282-52	SPRING
	84B	PQM30017-8	SLIT WASHER
	85	PQ44843A-1	ARM BASE ASSY
	85B	PQ33511-1-2	CLEANER ARM
	85C	PQ44841	CANCEL LEVER
	85D	PQM30001-299	TENSION SPRING
	85E	PQM30001-300	TENSION SPRING
	85F	PQM30017-5	SLIT WASHER
	86	SPST2606Z	SCREW
	87	PQ44840A	C.BASE ASSY
	87A	PQ44844A	C.BASE SA
	87B	PQ44837	CLEANER
	87C	PQ44838	CLEANER HOLDER
	87D	PQM30017-38	SLIT WASHER
	100	PQ20994B-4	MAIN DECK ASSY
	100A	PQ43849	EARTH PLATE
	100B	SPST2604Z	SCREW

4.5 REMOTE CONTROL UNIT <M5>



⚠	REF. No.	PART No.	PART NAME, DESCRIPTION

REMOTE CONTROLLER <M5>

⚠			
⚠	1	PQ11202A	REMOTE CONTROLLER
	2	PQ11203	COVER(FRONT)
	3	PQ11093	COVER(REAR)
	4	PQ33870	BUTTON(1)
	5	PQ21253	BUTTON(2)
	6	PQ33609	CAP(BATTERY)
	7	PQ33610	WINDOW(IR)
	8	PQ33871	DOOR
	9	PQ33872	PLATE
	10	PQ45167	WINDOW(DOOR)
	11	SSSF2008M	SCREW
	12	SSSF2006M	SCREW

SECTION 5
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

SWITCH REGULATOR BOARD ASSEMBLY <01>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20526A-01	SW REGULATOR BOARD ASSY	
	IC1	LM358N	IC	
		or LM358P	IC	
		or XRA10358	IC	
		or BA10358	IC	
	Q1	2SC4517A-LF619	TRANSISTOR	
	Q2	2SC3616(MLK)	TRANSISTOR	
	Q5	2SB1425(EU)	TRANSISTOR	
	D1	10E6-F2	DIODE	
	D2	10E6-F2	DIODE	
	D3	10E6-F2	DIODE	
	D4	10E6-F2	DIODE	
	D5	AU01	FR DIODE	
		or 1SR153-400-T2	FR DIODE	
	D6	AU01	FR DIODE	
		or 1SR153-400-T2	FR DIODE	
	D7	MTZ27BT-77	ZENER DIODE	
	D8	AU01Z	FR DIODE	
		or ERA48-02	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D14	AU01Z	FR DIODE	
		or ERA48-02	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D15	AU01Z	FR DIODE	
		or ERA48-02	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D16	FML-12S	FR DIODE	
		or 5DL2CZ41A	FR DIODE	
		or FCF06A20	FR DIODE	
	D17	FMB-24	BARRIER DIODE	
		or F5KQ40B	BARRIER DIODE	
		or 5GWJ2CZ42	SB DIODE	
	D18	AU01Z	FR DIODE	
		or ERA48-02	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D19	MTZ33AT-77	ZENER DIODE	
	D21	AU01Z	FR DIODE	
		or ERA48-02	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D22	MTZV6.2A	ZENER DIODE	
	D23	RD15ES-T1B1	ZENER DIODE	
	R1	YU40344-2R2	WW RESISTOR	2.2Ω,2W
	R2	QRD161J-334	RESISTOR	330kΩ,1/6W
	R3	QRD161J-334	RESISTOR	330kΩ,1/6W
	R4	QRD161J-563	RESISTOR	56kΩ,1/6W
	R5	QRG029J-683G	OMF RESISTOR	68kΩ,2W
	R6	QRG029J-241G	OMF RESISTOR	240Ω,2W
	R7	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R8	QRD161J-561	RESISTOR	560Ω,1/6W
	R9	QRX014J-R39Z	MF RESISTOR	0.39Ω,1W
	R10	QRG029J-273A	OMF RESISTOR	27kΩ,2W
⚠	R16	QRZ0077-470X	FUSIBLE RESISTOR	47Ω,1/4W
	R17	QRD161J-471	RESISTOR	470Ω,1/6W
	R18	QRD161J-102	RESISTOR	1kΩ,1/6W
	R19	QRV144F-1071A	CMF RESISTOR	1.07kΩ,1/4W
	R20	QRV144F-1001A	CMF RESISTOR	1kΩ,1/4W
⚠	R21	QRZ0077-470X	FUSIBLE RESISTOR	47Ω,1/4W
	R22	QRD161J-103	RESISTOR	10kΩ,1/6W
	R23	QRD161J-471	RESISTOR	470Ω,1/6W
	R24	QRV144F-4423AY	CMF RESISTOR	442kΩ,1/4W
	R25	QRV144F-1002A	CMF RESISTOR	10kΩ,1/4W
	R26	QRV144F-1182A	CMF RESISTOR	11.8kΩ,1/4W
⚠	R27	QRZ0052-130	FUSIBLE RESISTOR	13Ω,1/4W
	R28	QRD161J-331	RESISTOR	330Ω,1/6W
	R29	QRD161J-103	RESISTOR	10kΩ,1/6W
⚠	C1	QFZ9022-333	MM CAPACITOR	0.033μF,250V
⚠		or QFZ9037-333	M CAPACITOR	0.033μF,250V
⚠	C2	QFZ9022-333	MM CAPACITOR	0.033μF,250V
⚠		or QFZ9037-333	M CAPACITOR	0.033μF,250V
⚠	C3	QFZ9022-223	MM CAPACITOR	0.022μF,250V
⚠	C4	QCZ9016-101K	CAPACITOR	100pF,250V
⚠	C5	QCZ9016-101K	CAPACITOR	100pF,250V
⚠	C6	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠		or QCZ9048-222	CAPACITOR	0.0022μF,250V
⚠	C7	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠		or QCZ9048-222	CAPACITOR	0.0022μF,250V
⚠	C8	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠	C9	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠	C10	QCZ9016-222M	CAPACITOR	0.0022μF,250V
⚠	C11	QCZ9016-222M	CAPACITOR	0.0022μF,250V
	C12	PECA0738-826	E CAPACITOR	82μF,400V
		or PECA0793-826	E CAPACITOR	82μF,400V
	C13	QCZ0212-472	CAPACITOR	0.0047μF,1KV
	C14	QCZ0213-101Z	CAPACITOR	100pF,1KV
	C15	QFV11HJ-224	TF CAPACITOR	0.22μF,50V
		or PECA0780-224Z	M CAPACITOR	0.22μF,50V
	C16	QFL41HJ-682	M CAPACITOR	0.0068μF,50V
		or QFLA1HJ-682Z	M CAPACITOR	0.0068μF,50V
	C17	QETC1HM-475	E CAPACITOR	4.7μF,50V
	C18	QETC1JM-336	E CAPACITOR	33μF,63V
	C19	QEZ0125-277	E CAPACITOR	270μF,25V
		or QEZ0138-277	E CAPACITOR	270μF,25V
	C20	QETC1EM-227	E CAPACITOR	220μF,25V
	C21	QEZ0105-108	E CAPACITOR	1000μF,16V
		or QEZ0137-108	E CAPACITOR	1000μF,16V
	C22	QETB1CM-108	E CAPACITOR	1000μF,16V
	C23	QFL41HJ-102	M CAPACITOR	0.001μF,50V
		or QFLA1HJ-102Z	M CAPACITOR	0.001μF,50V

⚠	REF. No.		PART No.	PART NAME, DESCRIPTION	
	C24		QEZ0136-128	E CAPACITOR	1200μF,10V
		or	QEZ0106-128	E CAPACITOR	1200μF,10V
	C25		QETC1HM-476	E CAPACITOR	47μF,50V
	C26		QETC1VM-336	E CAPACITOR	33μF,35V
	C27		QFLA1HJ-103Z	M CAPACITOR	0.01μF,50V
	C28		QEZ0156-127Z	E CAPACITOR	120μF,6.3V
		or	QEZ0135-127Z	E CAPACITOR	120μF,6.3V
	C29		QETC0JM-107	E CAPACITOR	100μF,6.3V
	C30		QFLA1HJ-103Z	M CAPACITOR	0.01μF,50V
	C31		QETB1AM-108	E CAPACITOR	1000μF,10V
	C32		QETC1JM-226	E CAPACITOR	22μF,63V
	C34		QETC1CM-107	E CAPACITOR	100μF,16V
	C35		QFV11HJ-104	MM CAPACITOR	0.1μF,50V
		or	QFV41HJ-104	TF CAPACITOR	0.1μF,50V
	L1		PU60943-330K	COIL	33μH
		or	PELN0270-330K	COIL	33μH
		or	PELN0270-330KZ	COIL	33μH
		or	PELN0490-330K	COIL	33μH
	L2		PU60943-330K	COIL	33μH
		or	PELN0270-330K	COIL	33μH
		or	PELN0270-330KZ	COIL	33μH
		or	PELN0490-330K	COIL	33μH
	L3		PU60943-330K	COIL	33μH
		or	PELN0270-330K	COIL	33μH
		or	PELN0270-330KZ	COIL	33μH
		or	PELN0490-330K	COIL	33μH
⚠	PC1		PC111S	PHOTO COUPLER	
⚠	POC1		QMP3980-200	POWER CORD	
⚠	T1		PELN0480	SW TRANS	
⚠	BKT1		PQ33738	BRACKET(SW.REG)	
	ETH1		PQ43872	EARTH PLATE, ×2	
⚠	HD1		QHS3771-108	STRAIN RELIEF	
⚠	HD2		PU57505	FUSE CLIP, ×2	
⚠	HS1		PQ45175	HEAT SINK	
⚠	LF1		PU59707	LINE FILTER	
⚠		or	PELN0255	LINE FILTER	
⚠	LF2		PU61108	LINE FILTER	
⚠		or	PU60347	LINE FILTER	
	SCW1		SDST2605Z	SCREW, ×3	
	SCW2		SDSG3008Z	SCREW	
	SCW3		SDSG3006Z	SCREW	
	SLD1		PQ21202	SHIELD CASE(1)	
	SLD2		PQ33739	SHIELD CASE(2)	
	SLD3		PQ33740	SHIELD CASE(3)	
	SLD4		PQ33741	SHIELD CASE(4)	
⚠	TAB1		A74316	TAB, ×2	
	TP		PU56347	TEST POINT, ×2	
	CN1		PU60910-104	WIRE TRAP	
	CN2		PU60910-108	CONNECTOR	
⚠	CP1		ICP-N20	CIRCUIT PROTECTOR	
⚠	CP2		ICP-N20	CIRCUIT PROTECTOR	
⚠	F1		QMF51E2-1R0	FUSE	T1.0A
⚠		or	QMF51E2-1R0J1	FUSE	T1.0A

MAIN BOARD ASSEMBLY <03>

	PWBA		PB10553B	MAIN BOARD ASSY,E
			PB10553A-01	MAIN BOARD ASSY,EG
⚠	RF1		PERF0068	RF CONVERTER
	CL1		PEME0837	CLAMP
	ETH1		PQ43012-1-1	EARTH PLATE,FOR RF CONV
	HD1		PEME0831	HOLDER, ×2
	HD2		PEME0841	HOLDER, ×2
	SCW1		SDST2605Z	SCREW
	SCW2		SDSF2608Z	SCREW, ×2
	SPC1		PU60010	SPACER
⚠	TB1		PQ21199	TERMINAL BOARD,EG
⚠			PQ21199-2	TERMINAL BOARD,E
	WR1		PW30401-BB20T	COAXIAL CORD, RF CONV-TNR
		or	PW30402-BB20M	COAXIAL CORD
		or	PW30401-BB20S	COAXIAL CORD
	J701		PEMC0766	RGB21PIN SOCKET
	J702		PU60612	EARPHONE JACK
		or	PU61012	MINI JACK
	J703		PEMC0824	DIN CONNECTOR
	TP31		PU57545	TEST PIN, ×17(EG), X18(E)

—AUDIO SECTION—

⚠	IC1		BA7765AS	IC
⚠		or	XRA7765AS	IC
	Q1		2SC1740S(RS)	TRANSISTOR
		or	2SC3199(G)	TRANSISTOR
	Q2		2SC1740S(RS)	TRANSISTOR
		or	2SC3199(G)	TRANSISTOR
	Q3		DTA114ES	TRANSISTOR
	Q4		2SC1740S(RS)	TRANSISTOR
		or	2SC3199(G)	TRANSISTOR
	Q5		DTA124ES	TRANSISTOR
	Q6		DTA144ES	TRANSISTOR
	D2		1SS133	DIODE

⚠	REF. No.		PART No.	PART NAME, DESCRIPTION	
		or	MA165	DIODE	
	D3		RD5.1ES-T1B2	ZENER DIODE	
		or	UZ5.1BSB	ZENER DIODE	
		or	HZS5.1EB2	ZENER DIODE	
	R1		QRD161J-473	RESISTOR	47kΩ,1/6W
	R2		QRD161J-473	RESISTOR	47kΩ,1/6W
	R4		QRD161J-242	RESISTOR	2.4kΩ,1/6W
	R5		QRD161J-103	RESISTOR	10kΩ,1/6W
	R6		QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R7		QRD161J-102	RESISTOR	1kΩ,1/6W
	R8		QRD161J-471	RESISTOR	470Ω,1/6W
	R9		QRD161J-471	RESISTOR	470Ω,1/6W
	R10		QRD161J-100	RESISTOR	10Ω,1/6W
	R11		QVZ3518-683AZ	V RESISTOR,BIAS ADJ	68kΩ
		or	QVZ3523-683AZ	V RESISTOR,BIAS ADJ	68kΩ
	R12		QRD161J-153	RESISTOR	15kΩ,1/6W
	R13		QRD161J-6R8	RESISTOR	6.8Ω,1/6W
	R15		QRD161J-223	RESISTOR	22kΩ,1/6W
	R16		QRD161J-181	RESISTOR	180Ω,1/6W
	R17		QRD161J-274	RESISTOR	270kΩ,1/6W
	R18		QRD161J-103	RESISTOR	10kΩ,1/6W
	R21		QRD161J-183	RESISTOR	18kΩ,1/6W
	R22		QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R23		QRD161J-752	RESISTOR	7.5kΩ,1/6W
	R24		QRD161J-153	RESISTOR	15kΩ,1/6W
	R25		QRD161J-153	RESISTOR	15kΩ,1/6W
	R26		QRD161J-475	RESISTOR	4.7MΩ,1/6W
	R27		QRD161J-475	RESISTOR	4.7MΩ,1/6W
	R28		QRD161J-123	RESISTOR	12kΩ,1/6W
	R29		QRD161J-333	RESISTOR	33kΩ,1/6W
	R30		QRD161J-103	RESISTOR	10kΩ,1/6W
	R32		QRD161J-333	RESISTOR	33kΩ,1/6W
	R34		QRD161J-151	RESISTOR	150Ω,1/6W
	R36		QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R37		QRD161J-273	RESISTOR	27kΩ,1/6W
	R41		QRD161J-475	RESISTOR	4.7MΩ,1/6W
	R45		QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R46		QRD161J-472	RESISTOR	4.7kΩ,1/6W
⚠	R47		QRZ0077-4R7X	FUSIBLE RESISTOR	4.7Ω,1/4W
	R49		QRD161J-473	RESISTOR	47kΩ,1/6W
	R50		QRD161J-103	RESISTOR	10kΩ,1/6W
	C1		QCXB1CM-122	CAPACITOR	0.0012μF,16V
	C2		QCXB1CM-122	CAPACITOR	0.0012μF,16V
	C3		QCC11EJ-272	CAPACITOR	0.0027μF,25V
	C4		QCC11EJ-392	CAPACITOR	0.0039μF,25V
	C5		QETA1EM-475	E CAPACITOR	4.7μF,25V
	C6		QFL31HJ-122	M CAPACITOR	0.0012μF,50V
	C8		PU60550-105	E CAPACITOR	1μF,50V
	C9		QETC1CM-106	E CAPACITOR	10μF,16V
	C10		QFV71HJ-103	TF CAPACITOR	0.01μF,50V
	C11		QEK61HM-105	E CAPACITOR	1μF,50V
	C12		QETC1CM-106	E CAPACITOR	10μF,16V
	C13		QCC11CJ-104	CAPACITOR	0.1μF,16V
	C14		QETC1CM-336	E CAPACITOR	33μF,16V
	C15		QETC1HM-104	E CAPACITOR	0.1μF,50V
	C16		QETC1HM-105	E CAPACITOR	1μF,50V

⚠	REF. No.		PART No.	PART NAME, DESCRIPTION	
	C17		QFV71HJ-123	TF CAPACITOR	0.012μF,50V
	C19		QETC1CM-106	E CAPACITOR	10μF,16V
	C20		QCC11EJ-183	CAPACITOR	0.018μF,25V
	C21		QCC11EJ-272	CAPACITOR	0.0027μF,25V
	C24		QCC11EJ-222	CAPACITOR	0.0022μF,25V
	C25		QETC1CM-106	E CAPACITOR	10μF,16V
	C26		QCBB1HJ-331	CAPACITOR	330pF,50V
	C27		QFV71HJ-473	TF CAPACITOR	0.047μF,50V
	C28		QCXB1CM-122	CAPACITOR	0.0012μF,16V
	C29		QCBB1HJ-102	CAPACITOR	0.001μF,50V
	L1		PU58308-103J	COIL	10mH
	L2		PU59152-3R9J	COIL	3.9μH
	L3		PU59152-3R9J	COIL	3.9μH
	L4		PU59152-2R2J	COIL	2.2μH
	L5		PU48530-471K	COIL	470μH
	K1		PU60281-4	FERRITE BEADS, E	
			PU60281-5	FERRITE BEADS, EG	
⚠	T1		PU60510-3	OSC TRANSFORMER	
	CN1		PU59555-7	CONNECTOR	
	CN2		PU58844-2	CONNECTOR	

—VIDEO SECTION—

IC280		BA7106LS	IC
	or	XRA7106LS	IC
Q201		2SC1740S(RS)	TRANSISTOR
	or	2SC3199(GB)-TJK	TRANSISTOR
Q202		2SC1740S(RS)	TRANSISTOR
	or	2SC3199(GB)-TJK	TRANSISTOR
Q206		2SC1740S(RS)	TRANSISTOR
	or	2SC3199(GB)-TJK	TRANSISTOR
Q207		2SC1740S(RS)	TRANSISTOR
	or	2SC3199(GB)-TJK	TRANSISTOR
Q210		2SA933S(RS)	TRANSISTOR
	or	2SA1267(YG)-TJK	TRANSISTOR
Q211		2SA933S(RS)	TRANSISTOR
	or	2SA1267(YG)-TJK	TRANSISTOR
Q213		2SC1740S(RS)	TRANSISTOR
	or	2SC3199(GB)-TJK	TRANSISTOR
Q214		2SA933S(RS)	TRANSISTOR
	or	2SA1267(YG)-TJK	TRANSISTOR
Q217		DTA114ES	TRANSISTOR
D202		1SS133	DIODE
	or	MA165	DIODE
D207		1SS133	DIODE
	or	MA165	DIODE
D208		1SS133	DIODE
	or	MA165	DIODE
D212		1SS133	DIODE
	or	MA165	DIODE
D213		1SS133	DIODE
	or	MA165	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D214	1SS133	DIODE	
		or MA165	DIODE	
	D280	1SS133	DIODE	
		or MA165	DIODE	
	R201	QRD161J-102	RESISTOR	1kΩ,1/6W
	R202	QRD161J-223	RESISTOR	22kΩ,1/6W
	R203	QRD161J-223	RESISTOR	22kΩ,1/6W
	R206	QRD161J-101	RESISTOR	100Ω,1/6W
	R208	QVZ3518-332AZ	V RESISTOR,SP FREQ	3.3kΩ
		or QVZ3523-332AZ	V RESISTOR,SP FREQ	3.3kΩ
	R209	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R210	QRD161J-621	RESISTOR	620Ω,1/6W
	R211	QRD161J-333	RESISTOR	33kΩ,1/6W
	R212	QRD161J-153	RESISTOR	15kΩ,1/6W
	R213	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R214	QRD161J-102	RESISTOR	1kΩ,1/6W
	R215	QVZ3518-681AZ	V RESISTOR,SP REC COLOUR	680Ω
		or QVZ3523-681AZ	V RESISTOR,SP REC COLOUR	680Ω
	R216	QRD161J-153	RESISTOR	15kΩ,1/6W
	R217	QRD161J-103	RESISTOR	10kΩ,1/6W
	R218	QRD161J-102	RESISTOR	1kΩ,1/6W
	R227	QRD121J-391S	RESISTOR	390Ω,1/2W
	R229	QRD161J-123	RESISTOR	12kΩ,1/6W
	R230	QRD161J-103	RESISTOR	10kΩ,1/6W
	R240	QRD161J-271	RESISTOR	270Ω,1/6W
	R242	QRD161J-102	RESISTOR	1kΩ,1/6W
	R243	QRD161J-102	RESISTOR	1kΩ,1/6W
	R244	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R245	QRD161J-102	RESISTOR	1kΩ,1/6W
	R246	QVZ3518-222AZ	V RESISTOR,REC FM ADJ	2.2kΩ
		or QVZ3523-222AZ	V RESISTOR,REC FM ADJ	2.2kΩ
	R247	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R248	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R249	QRD161J-681	RESISTOR	680Ω,1/6W
	R250	QRD161J-750	RESISTOR	75Ω,1/6W
	R251	QRD161J-750	RESISTOR	75Ω,1/6W
	R257	QRD161J-562	RESISTOR	5.6kΩ,1/6W
	R258	QRD161J-562	RESISTOR	5.6kΩ,1/6W
	R259	QRD161J-561	RESISTOR	560Ω,1/6W
	R262	QRD161J-102	RESISTOR	1kΩ,1/6W
	R264	QRD161J-331	RESISTOR	330Ω,1/6W
	R265	QRD181J-102	RESISTOR, E	1kΩ,1/8W
		QRD161J-102	RESISTOR, EG	1kΩ,1/6W
	R280	QRD161J-914	RESISTOR	910kΩ,1/6W
	R281	QRD161J-681	RESISTOR	680Ω,1/6W
	R282	QRD161J-391	RESISTOR	390Ω,1/6W
	R283	QRD161J-104	RESISTOR	100kΩ,1/6W
	R284	QRD161J-273	RESISTOR	27kΩ,1/6W
	R285	QRD161J-103	RESISTOR	10kΩ,1/6W
	R286	QRD161J-333	RESISTOR	33kΩ,1/6W
	C201	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C202	QCSB1HJ-390	CAPACITOR	39pF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C203	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C204	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C205	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C206	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C207	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C208	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C209	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C212	QER61CM-476	E CAPACITOR	47μF,16V
	C213	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C214	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C215	QETC0JM-108	E CAPACITOR	1000μF,6.3V
	C216	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C217	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C222	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C226	QCSB1HK-4R7	CAPACITOR	4R0μF,50V
	C227	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C280	QETC1CM-106	E CAPACITOR	10μF,16V
	C281	QETC1HM-335	E CAPACITOR	3.3μF,50V
	C282	QCBB1HJ-471	CAPACITOR	470pF,50V
	C284	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C285	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C286	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C287	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C288	QFN31HJ-471	M CAPACITOR	470pF,50V
	C289	QCSB1HJ-270	CAPACITOR	27pF,50V
	C290	QCXB1CN-472	CAPACITOR	0.0047μF,16V
	C291	QCSB1HK-4R7	CAPACITOR	4R0μF,50V
	C293	QETC0JM-477	E CAPACITOR	470μF,6.3V
	C294	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C295	QCBB1HJ-101	CAPACITOR	100pF,50V
	L201	PU48530-101K	COIL	100μH
	L202	PU59152-180J	COIL	18μH
	L203	PU48530-101K	COIL	100μH
	L204	PU48530-101K	COIL	100μH
	L206	PU59152-121J	COIL	120μH
	L280	PU48530-101K	COIL	100μH
	L282	PU60655-2	COIL,SECAM DET	
	EQ201	PU54838	EQUALIZER	
		or PU60714	EQUALIZER	
	CN201	PU58844-5	CONNECTOR	
	CN203	PU59555-3	CONNECTOR	

—SERVO SECTION—

	IC401	HD49733NT	IC
		or HD49733ANT	IC
	IC501	BA7039	IC
		or XRA7039	IC
	Q402	2SA1309(QRS)	TRANSISTOR
		or 2SA933S(QRS)	TRANSISTOR
		or 2SA1267(YG)-TJK	TRANSISTOR

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D401	1SS133	DIODE	
	or	MA165	DIODE	
	D402	1SS133	DIODE	
	or	MA165	DIODE	
	D403	1SS133	DIODE	
	or	MA165	DIODE	
	D404	1SS133	DIODE	
	or	MA165	DIODE	
	D407	1SS133	DIODE	
	or	MA165	DIODE	
	D408	1SS133	DIODE	
	or	MA165	DIODE	
	D409	1SS133	DIODE	
	or	MA165	DIODE	
	D410	1SS133	DIODE	
	or	MA165	DIODE	
	R401	QRD161J-223	RESISTOR	22kΩ,1/6W
	R402	QRD161J-225	RESISTOR	2.2MΩ,1/6W
	R403	QRD161J-683	RESISTOR	68kΩ,1/6W
	R404	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R405	QRD161J-123	RESISTOR	12kΩ,1/6W
	R406	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R407	QRD161J-392	RESISTOR	3.9kΩ,1/6W
	R408	QRD161J-105	RESISTOR	1MΩ,1/6W
	R409	QRD161J-273	RESISTOR	27kΩ,1/6W
	R411	QRD161J-105	RESISTOR	1MΩ,1/6W
	R412	QRD161J-273	RESISTOR	27kΩ,1/6W
	R413	QRD161J-273	RESISTOR	27kΩ,1/6W
	R414	QRD161J-335	RESISTOR	3.3MΩ,1/6W
	R415	QRD161J-334	RESISTOR	330kΩ,1/6W
	R416	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R418	QRD161J-102	RESISTOR	1kΩ,1/6W
	R419	QRD161J-473	RESISTOR	47kΩ,1/6W
	R420	QVZ3518-684	V RESISTOR,SP PB SW POINT	680kΩ
	R422	QRD161J-104	RESISTOR	100kΩ,1/6W
	R426	QRD161J-821	RESISTOR	820Ω,1/6W
	R427	QRD161J-102	RESISTOR	1kΩ,1/6W
	R428	QRD161J-105	RESISTOR	1MΩ,1/6W
	R429	QRD161J-102	RESISTOR	1kΩ,1/6W
	R430	QRD161J-102	RESISTOR	1kΩ,1/6W
	R434	QRD161J-102	RESISTOR	1kΩ,1/6W
	R435	QRD161J-102	RESISTOR	1kΩ,1/6W
	R436	QRD161J-274	RESISTOR	270kΩ,1/6W
	R437	QRD161J-274	RESISTOR	270kΩ,1/6W
	R438	QRD161J-224	RESISTOR	220kΩ,1/6W
	R439	QRD161J-103	RESISTOR	10kΩ,1/6W
	R440	QRD161J-474	RESISTOR	470kΩ,1/6W
	R441	QRD161J-823	RESISTOR	82kΩ,1/6W
	R501	QRD161J-102	RESISTOR	1kΩ,1/6W
	R502	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R503	QRD161J-272	RESISTOR	2.7kΩ,1/6W
	R508	QRD161J-124	RESISTOR	120kΩ,1/6W
	C401	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C402	QEK61AM-226	E CAPACITOR	22μF,10V
	C403	QFV11HJ-224	TF CAPACITOR	0.22μF,50V
	C404	QCC31CK-682	CAPACITOR	0.0068μF,16V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C405	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C406	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C407	QEK61CM-106	E CAPACITOR	10μF,16V
	C408	QEK61CM-106	E CAPACITOR	10μF,16V
	C409	QCC31CK-223	CAPACITOR	0.022μF,16V
	C410	QFV71HJ-184	TF CAPACITOR	0.18μF,50V
	or	QFV11HJ-184	MMT CAP	0.18μF,50V
	C411	QCBB1HJ-471	CAPACITOR	470pF,50V
	C412	QFL31HJ-682	M CAPACITOR	0.0068μF,50V
	or	QFN31HJ-682	M CAPACITOR	0.0068μF,50V
	C414	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C415	QEK61AM-226	E CAPACITOR	22μF,10V
	C416	QEK61AM-226	E CAPACITOR	22μF,10V
	C417	QCBB1HJ-271	CAPACITOR	270pF,50V
	C418	QCBB1HJ-561	CAPACITOR	560pF,50V
	C419	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C420	QEK61HM-105	E CAPACITOR	1μF,50V
	C421	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C422	QFV71HJ-563	TF CAPACITOR	0.056μF,50V
	or	QFV11HJ-563	MMT CAP	0.056μF,50V
	C423	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C427	QCBB1HJ-181	CAPACITOR	180pF,50V
	C502	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C504	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
	or	QFV11HJ-104	MM CAPACITOR	0.1μF,50V
	C505	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C506	QFV71HJ-683	TF CAPACITOR	0.068μF,50V
	or	QFV11HJ-683	MMT CAP	0.068μF,50V
	C507	QCVB1CM-103	CAPACITOR	0.01μF,16V
	C508	QEK61AM-226	E CAPACITOR	22μF,10V
	C509	QCVB1CM-103	CAPACITOR	0.01μF,16V
	L501	PU59152-270J	COIL	27μH
	CN401	PU59555-4	CONNECTOR	
⚠	CP401	ICP-F15	CIRCUIT PROTECTOR	

—MECHACON SECTION—

	IC601	M37524M3-150SP	IC
	IC602	CAT35C104P-007	IC
	Q601	2SB1425(EU)	TRANSISTOR
	Q602	DTC114ES	TRANSISTOR
	Q605	DTA124ES	TRANSISTOR
	D601	MA165	DIODE
	or	1SS133	DIODE
	D602	HZS8.2EB2TJ	ZENER DIODE
	or	MTZ8.2BT-77	ZENER DIODE
	or	UZ8.2BSB	ZENER DIODE
	D603	MA165	DIODE
	or	1SS133	DIODE
	D604	MA165	DIODE
	or	1SS133	DIODE
	D605	MA165	DIODE
	or	1SS133	DIODE
	D606	11ES2	DIODE
	or	ERA15-02	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
		or S5688G	DIODE	
		or 1SR139-200	DIODE	
	D607	MA165	DIODE	
		or 1SS133	DIODE	
	R601	QRD161J-681	RESISTOR	680Ω,1/6W
	R602	QRD161J-105	RESISTOR	1MΩ,1/6W
	R603	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R604	QRD161J-103	RESISTOR	10kΩ,1/6W
	R605	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R606	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R607	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R608	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R609	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R610	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R611	QRD161J-102	RESISTOR	1kΩ,1/6W
	R612	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R613	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R614	QRD161J-332	RESISTOR	3.3kΩ,1/6W
	R615	QRD161J-103	RESISTOR	10kΩ,1/6W
	R616	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R617	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R618	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R619	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R620	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R621	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R622	QRD161J-102	RESISTOR	1kΩ,1/6W
	R623	QRD161J-102	RESISTOR	1kΩ,1/6W
	R624	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R625	QRD161J-102	RESISTOR	1kΩ,1/6W
	R626	QRD161J-102	RESISTOR	1kΩ,1/6W
	R627	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R628	QRD161J-102	RESISTOR	1kΩ,1/6W
	R629	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R630	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R631	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R632	QRD161J-103	RESISTOR	10kΩ,1/6W
	R633	QRD161J-471	RESISTOR	470Ω,1/6W
	R634	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R636	QRD161J-821	RESISTOR	820Ω,1/6W
	R638	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R639	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R640	QRD161J-303	RESISTOR	30kΩ,1/6W
	R641	QRD161J-224	RESISTOR	220kΩ,1/6W
	R642	QRD161J-563	RESISTOR	56kΩ,1/6W
	R643	QRD161J-154	RESISTOR	150kΩ,1/6W
	R644	QRD161J-333	RESISTOR	33kΩ,1/6W
	R645	QRD161J-103	RESISTOR	10kΩ,1/6W
	R647	QRD161J-103	RESISTOR	10kΩ,1/6W
	R649	QRD161J-103	RESISTOR	10kΩ,1/6W
	R650	QRD161J-103	RESISTOR	10kΩ,1/6W
	R651	QRD161J-103	RESISTOR	10kΩ,1/6W
	R652	QRD161J-103	RESISTOR	10kΩ,1/6W
	R653	QRD161J-103	RESISTOR	10kΩ,1/6W
	R654	QRD161J-561	RESISTOR	560Ω,1/6W
	C601	QCFB1EZ-223	CAPACITOR	0.022μF,25V
	C602	QEK61EM-335	E CAPACITOR	3.3μF,25V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C603	QER61HM-105	E CAPACITOR	1μF,50V
	C604	QEK60JM-107	E CAPACITOR	100μF,6.3V
	C605	QCBB1HJ-121	CAPACITOR	120pF,50V
	C606	QCC11EK-473	CAPACITOR	0.047μF,25V
	L601	PU59152-2R2J	COIL	2.2μH
⚠	CF601	PEVB0340	RESONATOR	
⚠	TH801	PU52108-1R0	POSITIVE THERMISTOR	
	CN601	PEMC0722-017	WIRE TRAP	
		or PEMC0753-017	WIRE TRAP	
	CN602	PU59555-4	CONNECTOR	
	CN603	PU60910-10	WIRE TRAP	
⚠	CP602	ICP-F20	CIRCUIT PROTECTOR	

—REGULATOR SECTION—

	IC801	UPC24M05HF	IC,E	
		UPC2405HF	IC,EG	
		or LM2940CT-5.0	IC	
	Q801	2SB1425(EU)	TRANSISTOR	
⚠	Q802	2SC1740S	TRANSISTOR	
	Q803	2SB941P	TRANSISTOR	
		or 2SA1488	TRANSISTOR	
	Q804	2SC1740S(Q)	TRANSISTOR	
	Q805	2SC1740S	TRANSISTOR	
	Q806	2SA933S	TRANSISTOR	
		or 2SA1267(YG)-TJK	TRANSISTOR	
	D801	1SS133	DIODE	
		or MA165	DIODE	
	D802	UZ5.1BSC	ZENER DIODE	
		or MTZV5.1C	ZENER DIODE	
		or RD5.1ES-T1B3	ZENER DIODE	
	R801	QRD161J-103	RESISTOR	10kΩ,1/6W
	R802	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R803	QRD161J-102	RESISTOR	1kΩ,1/6W
	R804	QRD161J-102	RESISTOR	1kΩ,1/6W
	R805	QRD161J-102	RESISTOR	1kΩ,1/6W
	R806	QRD161J-103	RESISTOR	10kΩ,1/6W
	R807	QRD161J-221	RESISTOR	220Ω,1/6W
	R808	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R809	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R810	QRD161J-471	RESISTOR	470Ω,1/6W
	R811	QVZ3518-471A	V RESISTOR,SWD5V	470Ω
		or QVZ3523-471A	V RESISTOR,SWD5V	470Ω
	R812	QRD161J-103	RESISTOR	10kΩ,1/6W
	C803	QETC1CM-107	E CAPACITOR	100μF,16V
	C804	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C805	QETC1AM-107	E CAPACITOR	100μF,10V
	C806	QFLA1HJ-103Z	M CAPACITOR	0.01μF,50V
	C807	QETC1CM-476	E CAPACITOR	47μF,16V
	C808	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C809	QFN31HJ-102	M CAPACITOR	0.001μF,50V
	C811	QETC0JM-107	E CAPACITOR	100μF,6.3V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	CN801	PU61044-8	WIRE TRAP	
		—VPS SECTION <EG ONLY>—		
	IC101	SAA4700	IC	
	R101	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R102	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R103	QRD161J-753	RESISTOR	75kΩ,1/6W
	C101	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C102	QCXB1CN-472	CAPACITOR	0.0047μF,16V
	C103	QFJ41HJ-104	M CAPACITOR	0.1μF,50V
	C104	QCBB1HJ-471	CAPACITOR	470pF,50V
	C105	QFJ41HJ-104	M CAPACITOR	0.1μF,50V
	C106	QCXB1CN-472	CAPACITOR	0.0047μF,16V
	C107	QCF11HP-223	CAPACITOR	0.022μF,50V
	or	QCF31HP-223	CAPACITOR	0.022μF,50V
		—TERMINAL SECTION—		
	Q702	2SB810H,J	TRANSISTOR	
	D701	1SS133	DIODE	
	or	MA165	DIODE	
	D702	1SS133	DIODE	
	or	MA165	DIODE	
	D705	1SS133	DIODE	
	or	MA165	DIODE	
	R703	QRD161J-393	RESISTOR	39kΩ,1/6W
	R704	QRD161J-102	RESISTOR	1kΩ,1/6W
	L701	PU59152-100J	COIL	10μH
	L703	PU59152-100J	COIL	10μH
	CN701	PEMC0823-009	B TO B CONN	
	CN703	PEMC0823-009	B TO B CONN	

****

VIDEO UNIT BOARD ASSEMBLY <05>

PWBA	PB10554A-02	VIDEO UNIT BOARD ASSY	
IC1	JCP0016-2	IC	
IC2	TL8827P	IC	
Q1	2SA1576(QRS)	TRANSISTOR	
Q5	2SA1576(QRS)	TRANSISTOR	
Q10	2SC4081(QRS)	TRANSISTOR	
Q11	DTC144WU	TRANSISTOR	
Q12	DTC144WU	TRANSISTOR	
Q13	DTC144WU	TRANSISTOR	
Q14	DTC144WU	TRANSISTOR	
Q16	DTC144WU	TRANSISTOR	
Q18	2SC4081(QRS)	TRANSISTOR	
Q19	2SC4081(QRS)	TRANSISTOR	
Q20	2SC4081(QRS)	TRANSISTOR	
Q21	2SA1576(QRS)	TRANSISTOR	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	Q22	2SA1576(QRS)	TRANSISTOR	
	Q23	DTC144WU	TRANSISTOR	
	Q24	2SA1576(QRS)	TRANSISTOR	
	Q25	2SC4081(QRS)	TRANSISTOR	
	Q26	2SC4081(QRS)	TRANSISTOR	
	Q28	2SC4081(QRS)	TRANSISTOR	
	Q29	2SC4081(QRS)	TRANSISTOR	
	Q30	2SC4081(QRS)	TRANSISTOR	
	D1	1SS292	DIODE	
	D3	1SS133	DIODE	
	or	MA165	DIODE	
	D4	1SS133	DIODE	
	or	MA165	DIODE	
	D5	1SS133	DIODE	
	or	MA165	DIODE	
	D6	1SS133	DIODE	
	or	MA165	DIODE	
	D7	DAN202U	DIODE	
	D8	1SS133	DIODE	
	or	MA165	DIODE	
	D10	1SS133	DIODE	
	or	MA165	DIODE	
	D11	1SS133	DIODE	
	or	MA165	DIODE	
	D12	1SS133	DIODE	
	or	MA165	DIODE	
	D14	1SS133	DIODE	
	or	MA165	DIODE	
	D15	1SS133	DIODE	
	or	MA165	DIODE	
	D17	DAN202U	DIODE	
	D19	1SS133	DIODE	
	or	MA165	DIODE	
	D20	1SS133	DIODE	
	or	MA165	DIODE	
	R1	NRSA63J-681N	RESISTOR	680Ω,1/16W
	or	NRSA63J-681NC	RESISTOR	680Ω,1/16W
	R2	NRSA63J-475N	RESISTOR	4.7MΩ,1/16W
	or	NRSA63J-475NC	RESISTOR	4.7MΩ,1/16W
	R3	NRSA63J-475N	RESISTOR	4.7MΩ,1/16W
	or	NRSA63J-475NC	RESISTOR	4.7MΩ,1/16W
	R6	NRSA63J-361N	RESISTOR	360Ω,1/16W
	or	NRSA63J-361NC	RESISTOR	360Ω,1/16W
	R10	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	or	NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R11	NRSA63J-681N	RESISTOR	680Ω,1/16W
	or	NRSA63J-681NC	RESISTOR	680Ω,1/16W
	R12	ERS-L39J-102U	RESISTOR	1kΩ
	R13	QRD161J-102	RESISTOR	1kΩ,1/6W
	R16	NRSA63J-392N	RESISTOR	3.9kΩ,1/16W
	or	NRSA63J-392NC	RESISTOR	3.9kΩ,1/16W
	R17	NVP1301-222NU	V. RESISTOR, PB Y LEVEL	2.2kΩ
	R18	NRSA63J-333N	RESISTOR	33kΩ,1/16W
	or	NRSA63J-333NC	RESISTOR	33kΩ,1/16W
	R19	NRSA63J-823N	RESISTOR	82kΩ,1/16W
	or	NRSA63J-823NC	RESISTOR	82kΩ,1/16W
	R21	NRSA63J-331N	RESISTOR	330Ω,1/16W
	or	NRSA63J-331NC	RESISTOR	330Ω,1/16W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R22	NRSA63J-621N	RESISTOR	620Ω,1/16W
		or NRSA63J-621NC	RESISTOR	620Ω,1/16W
	R23	NRSA63J-561N	RESISTOR	560Ω,1/16W
		or NRSA63J-561NC	RESISTOR	560Ω,1/16W
	R24	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
		or NRSA63J-182NC	RESISTOR	1.8kΩ,1/16W
	R25	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
		or NRSA63J-222NC	RESISTOR	2.2kΩ,1/16W
	R26	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R27	NRSA63J-183N	RESISTOR	18kΩ,1/16W
		or NRSA63J-183NC	RESISTOR	18kΩ,1/16W
	R28	NRSA63J-822N	RESISTOR	8.2kΩ,1/16W
		or NRSA63J-822NC	RESISTOR	8.2kΩ,1/16W
	R29	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
		or NRSA63J-562NC	RESISTOR	5.6kΩ,1/16W
	R30	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
		or NRSA63J-562NC	RESISTOR	5.6kΩ,1/16W
	R31	NRSA63J-183N	RESISTOR	18kΩ,1/16W
		or NRSA63J-183NC	RESISTOR	18kΩ,1/16W
	R32	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
		or NRSA63J-562NC	RESISTOR	5.6kΩ,1/16W
	R33	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
		or NRSA63J-562NC	RESISTOR	5.6kΩ,1/16W
	R35	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
		or NRSA63J-332NC	RESISTOR	3.3kΩ,1/16W
	R36	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
		or NRSA63J-562NC	RESISTOR	5.6kΩ,1/16W
	R37	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
		or NRSA63J-332NC	RESISTOR	3.3kΩ,1/16W
	R38	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
		or NRSA63J-332NC	RESISTOR	3.3kΩ,1/16W
	R40	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R41	NVP1301-223NU	V. RESISTOR, CARRIER	22kΩ
	R42	NVP1301-103NU	V. RESISTOR, DEVIATION	10kΩ
	R43	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
		or NRSA63J-222NC	RESISTOR	2.2kΩ,1/16W
	R44	NRSA63J-432N	RESISTOR	4.3kΩ,1/16W
		or NRSA63J-432NC	RESISTOR	4.3kΩ,1/16W
	R45	NRSA63J-122N	RESISTOR	1.2kΩ,1/16W
		or NRSA63J-122NC	RESISTOR	1.2kΩ,1/16W
	R46	NRSA63J-431N	RESISTOR	430Ω,1/16W
		or NRSA63J-431NC	RESISTOR	430Ω,1/16W
	R47	NRSA63J-103N	RESISTOR	10kΩ,1/16W
		or NRSA63J-103NC	RESISTOR	10kΩ,1/16W
	R48	NRSA63G-102N	RESISTOR	1kΩ,1/16W
		or NRSA63G-102NC	RESISTOR	1kΩ,1/16W
	R49	NRSA63J-103N	RESISTOR	10kΩ,1/16W
		or NRSA63J-103NC	RESISTOR	10kΩ,1/16W
	R51	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R52	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R53	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R54	NRSA63J-242N	RESISTOR	2.4kΩ,1/16W
		or NRSA63J-242NC	RESISTOR	2.4kΩ,1/16W
	R55	NRSA63J-392N	RESISTOR	3.9kΩ,1/16W
		or NRSA63J-392NC	RESISTOR	3.9kΩ,1/16W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R56	NVP1301-152NZ	V. RESISTOR, N.C BALANCE	1.5kΩ
	R57	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R58	NRSA63J-821N	RESISTOR	820Ω,1/16W
		or NRSA63J-821NC	RESISTOR	820Ω,1/16W
	R59	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R60	NVP1301-103NU	V. RESISTOR, EE Y LEVEL	10kΩ
	R61	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R62	NRSA63J-334N	RESISTOR	330kΩ,1/16W
		or NRSA63J-334NC	RESISTOR	330kΩ,1/16W
	R63	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R64	NVP1301-332NU	V. RESISTOR, WHITE CLIP	3.3kΩ
	R65	NRSA63J-103N	RESISTOR	10kΩ,1/16W
		or NRSA63J-103NC	RESISTOR	10kΩ,1/16W
	R66	NRSA63J-434N	RESISTOR	430kΩ,1/16W
		or NRSA63J-434NC	RESISTOR	430kΩ,1/16W
	R67	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R68	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R69	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R70	NRSA63J-471N	RESISTOR	470Ω,1/16W
		or NRSA63J-471NC	RESISTOR	470Ω,1/16W
	R71	NRSA63J-122N	RESISTOR	1.2kΩ,1/16W
		or NRSA63J-122NC	RESISTOR	1.2kΩ,1/16W
	R72	NRSA63J-333N	RESISTOR	33kΩ,1/16W
		or NRSA63J-333NC	RESISTOR	33kΩ,1/16W
	R73	NRSA63J-333N	RESISTOR	33kΩ,1/16W
		or NRSA63J-333NC	RESISTOR	33kΩ,1/16W
	R74	NRSA63J-681N	RESISTOR	680Ω,1/16W
		or NRSA63J-681NC	RESISTOR	680Ω,1/16W
	R75	NRSA63J-561N	RESISTOR	560Ω,1/16W
		or NRSA63J-561NC	RESISTOR	560Ω,1/16W
	R76	NRSA63J-102N	RESISTOR	1kΩ,1/16W
		or NRSA63J-102NC	RESISTOR	1kΩ,1/16W
	R77	NRSA63J-562N	RESISTOR	5.6kΩ,1/16W
		or NRSA63J-562NC	RESISTOR	5.6kΩ,1/16W
	R78	NRSA63J-681N	RESISTOR	680Ω,1/16W
		or NRSA63J-681NC	RESISTOR	680Ω,1/16W
	R79	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
		or NRSA63J-222NC	RESISTOR	2.2kΩ,1/16W
	R81	NRSA63J-475N	RESISTOR	4.7MΩ,1/16W
		or NRSA63J-475NC	RESISTOR	4.7MΩ,1/16W
	R83	NRSA63J-272N	RESISTOR	2.7kΩ,1/16W
		or NRSA63J-272NC	RESISTOR	2.7kΩ,1/16W
	R84	NRSA63J-105N	RESISTOR	1MΩ,1/16W
		or NRSA63J-105NC	RESISTOR	1MΩ,1/16W
	R85	NRSA63J-155N	RESISTOR	1.5MΩ,1/16W
		or NRSA63J-155NC	RESISTOR	1.5MΩ,1/16W
	C1	NCS31HJ-101A	CAPACITOR	100pF,50V
	C4	NCS31HG-561A	CAPACITOR	560pF,50V
	C8	NCF31CZ-473A	CAPACITOR	0.047μF,16V
	C9	NCS31HJ-150A	CAPACITOR	15pF,50V
	C11	NCS31HJ-560A	CAPACITOR	56pF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C12	NCS31HJ-220A	CAPACITOR	22pF,50V
	C13	NCS31HG-121A	CAPACITOR	120pF,50V
	C14	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C16	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C17	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C18	NCS31HJ-820A	CAPACITOR	82pF,50V
	C19	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C20	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C21	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C22	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C23	QETC1CM-106	E CAPACITOR	10μF,16V
	C24	QEN61AM-226	NP E CAPACITOR	22μF,10V
	or	QENC1AM-226	NP E CAPACITOR	22μF,10V
	C25	QETC1CM-106	E CAPACITOR	10μF,16V
	C26	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C27	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C29	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C30	QETC1HM-225	E CAPACITOR	2.2μF,50V
	C31	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C32	NCS31HG-201A	CAPACITOR	200pF,50V
	C33	NCB31EK-223A	CAPACITOR	0.022μF,25V
	C34	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C35	NCS31HG-150A	CAPACITOR	15pF,50V
	C36	QETC1HM-105	E CAPACITOR	1μF,50V
	C37	NCB31EK-223A	CAPACITOR	0.022μF,25V
	C38	NCS31HJ-101A	CAPACITOR	100pF,50V
	C40	NCS31HJ-390A	CAPACITOR	39pF,50V
	C41	NCF31CZ-104A	CAPACITOR	0.1μF,16V
	C42	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C43	QETC1CM-106	E CAPACITOR	10μF,16V
	C44	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C45	QETC1CM-106	E CAPACITOR	10μF,16V
	C46	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C47	QETC1HM-105	E CAPACITOR	1μF,50V
	C48	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C49	NCB31HK-472A	CAPACITOR	0.0047μF,50V
	C50	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C51	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C52	QETC1HM-105	E CAPACITOR	1μF,50V
	C53	QETC1CM-106	E CAPACITOR	10μF,16V
	C54	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C56	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C57	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C58	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C59	NCF31CZ-473A	CAPACITOR	0.047μF,16V
	C60	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C61	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C62	NCB31CK-333A	CAPACITOR	0.033μF,16V
	C63	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C64	QETC1HM-104	E CAPACITOR	0.1μF,50V
	C65	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C66	QETC1HM-104	E CAPACITOR	0.1μF,50V
	C67	NCF31CZ-473A	CAPACITOR	0.047μF,16V
	C69	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C70	NCF31CZ-473A	CAPACITOR	0.047μF,16V
	C71	NCB31HK-272A	CAPACITOR	0.0027μF,50V
	C72	QETC1EM-475	E CAPACITOR	4.7μF,25V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C73	QETC1HM-105	E CAPACITOR	1μF,50V
	C74	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C75	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C76	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C77	QETC1HM-104	E CAPACITOR	0.1μF,50V
	C78	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C79	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C80	NCS31HJ-240A	CAPACITOR	24pF,50V
	C82	QETC1HM-225	E CAPACITOR	2.2μF,50V
	C84	NCS31HJ-180A	CAPACITOR	18pF,50V
	C91	NCS31HJ-620A	CAPACITOR	62pF,50V
	C93	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C95	NCS31HJ-120A	CAPACITOR	12pF,50V
	C96	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C97	NCF31CZ-104A	CAPACITOR	0.1μF,16V
	C98	NCB31HK-102A	CAPACITOR	0.001μF,50V
	C99	NCS31HJ-180A	CAPACITOR	18pF,50V
	C100	NCS31HG-361A	CAPACITOR	360pF,50V
	L3	PU59152-330J	COIL	33μH
	L4	PU59152-330J	COIL	33μH
	L5	PU59152-330J	COIL	33μH
	L6	PU59152-820J	COIL	82μH
	L7	PU59152-221J	COIL	220μH
	L8	PU48530-101K	COIL	100μH
	L9	PU48530-101K	COIL	100μH
	L10	PU59152-680J	COIL	68μH
	L11	PU48530-101K	COIL	100μH
	L12	PU48530-101K	COIL	100μH
	L13	PU48530-561J	COIL	560μH
	L14	PU48530-222J	COIL	2.2mH
	L15	PU59152-150J	COIL	15μH
	L16	PU59152-820J	COIL	82μH
	LPF1	PELN0477	LOW PASS FILTER	
	LPF2	PELN0478	LOW PASS FILTER	
	LPF3	PU60128-2	LOW PASS FILTER	
	DL1	PU60490	COMB FILTER	
	or	PU60222	2H DELAY LINE	
	or	PU60340-2	COMB FILTER	
⚠	X1	PEVB0386	CRYSTAL RESONATOR	
	SLD1	PQ45174	SHIELD PLATE	
	SLD2	PQ45173	SHIELD CASE	
	CN1	PEMC0712-113	PIN HEADER	
	CN2	PEMC0712-113	PIN HEADER	
	CN3	PEMC0712-113	PIN HEADER	

****

TUNER UNIT BOARD ASSEMBLY <07>

	PWBA	PB10522A-01	TUNER/IF BOARD ASSY
⚠	TNR1	PERF0066	UHF/VHF TUNER

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC1	LA7575	IC	
	Q1	2SB810H,J	TRANSISTOR	
	Q2	2SD1450S,T	TRANSISTOR	
	Q3	2SD1450S,T	TRANSISTOR	
	Q4	2SD1819A(RS)	TRANSISTOR	
	Q5	2SK381(C)	FE TRANSISTOR	
	Q6	DTC144EU	TRANSISTOR	
	Q7	DTA144EU	TRANSISTOR	
	Q8	2SA1532(C)	TRANSISTOR	
	Q15	2SD1819A(RS)	TRANSISTOR	
	Q16	DTC144EU	TRANSISTOR	
	Q17	2SD1819A(RS)	TRANSISTOR	
	Q18	DTC144EU	TRANSISTOR	
	Q19	2SD1819A(RS)	TRANSISTOR	
	Q21	2SA1532(C)	TRANSISTOR	
	D1	E-452-2	DIODE	
	D2	HZT33-02	ZENER DIODE	
	D4	MTZ11B	ZENER DIODE	
	R1	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
	R2	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
	R3	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
	R13	NRSA63J-104N	RESISTOR	100kΩ,1/16W
	R19	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R23	QRD161J-151	RESISTOR	150Ω,1/6W
	R32	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
	R33	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R34	NRSA63J-153N	RESISTOR	15kΩ,1/16W
	R41	NRSA63J-750N	RESISTOR	75Ω,1/16W
	R45	NRSA63J-750N	RESISTOR	75Ω,1/16W
	R48	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
	R51	QRD161J-331	RESISTOR	330Ω,1/6W
	R52	NRSA63J-101N	RESISTOR	100Ω,1/16W
	R54	NRSA63J-824N	RESISTOR	820kΩ,1/16W
	R59	NRSA63J-151N	RESISTOR	150Ω,1/16W
	R61	NRSA63J-151N	RESISTOR	150Ω,1/16W
	R63	NRSA63J-102N	RESISTOR	1kΩ,1/16W
	R65	NRSA63J-910N	RESISTOR	91Ω,1/16W
	R66	NRSA63J-911N	RESISTOR	910Ω,1/16W
	R67	NRSA63J-331N	RESISTOR	330Ω,1/16W
	R70	QRD161J-471	RESISTOR	470Ω,1/6W
	R71	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
	R72	QVZ3518-333	V RESISTOR,RF AGC	33kΩ
	R74	NRSA63J-182N	RESISTOR	1.8kΩ,1/16W
	R76	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R78	NRSA63J-153N	RESISTOR	15kΩ,1/16W
	R79	NRSA63J-153N	RESISTOR	15kΩ,1/16W
	R80	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R81	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
	R82	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R83	NRSA63J-822N	RESISTOR	8.2kΩ,1/16W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R84	NRSA63J-105N	RESISTOR	1MΩ,1/16W
	R85	NRSA63J-623N	RESISTOR	62kΩ,1/16W
	R86	NRSA63J-273N	RESISTOR	27kΩ,1/16W
	R87	NRSA63J-681N	RESISTOR	680Ω,1/16W
	R89	NRSA63J-471N	RESISTOR	470Ω,1/16W
	R91	QRSA08J-184YN	RESISTOR	180kΩ,1/10W
	R92	NRSA63J-223N	RESISTOR	22kΩ,1/16W
	R93	NRSA63J-103N	RESISTOR	10kΩ,1/16W
	R94	NRSA63J-822N	RESISTOR	8.2kΩ,1/16W
	R95	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
	R96	NRSA63J-392N	RESISTOR	3.9kΩ,1/16W
	R97	NRSA63J-682N	RESISTOR	6.8kΩ,1/16W
	R105	NRSA63J-222N	RESISTOR	2.2kΩ,1/16W
	C2	NCS31HJ-471A	CAPACITOR	470pF,50V
	C3	QCBB1HK-102	CAPACITOR	0.001μF,50V
	C5	QETF1CM-476	E CAPACITOR	47μF,16V
	C6	NCB31HK-102A	CAPACITOR	0.001μF,50V
	C8	QETF1HM-106	E CAPACITOR	10μF,50V
	C12	QETF1CM-106	E CAPACITOR	10μF,16V
	C16	QETF1HM-225	E CAPACITOR	2.2μF,50V
	C20	QETF1CM-106	E CAPACITOR	10μF,16V
	C25	QETF1HM-104	E CAPACITOR	0.1μF,50V
	C34	NCT06CH-3R0A	CAPACITOR	3pF,50V
	C35	NCT06CH-4R0A	CAPACITOR	4pF,50V
	C37	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
	C39	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C41	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C42	QETF1CM-476	E CAPACITOR	47μF,16V
	C43	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C44	QETF1CM-476	E CAPACITOR	47μF,16V
	C47	QFN31HK-683	M CAPACITOR	0.068μF,50V
	C48	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C50	QETF1HM-474	E CAPACITOR	0.47μF,50V
	C51	NCS31HJ-750A	CAPACITOR	75pF,50V
	C53	NCS31HJ-120A	CAPACITOR	12pF,50V
	C55	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C56	QETC1CM-336	E CAPACITOR	33μF,16V
	C60	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C61	NCS31HJ-331A	CAPACITOR	330pF,50V
	C62	QETF1HM-474	E CAPACITOR	0.47μF,50V
	C63	NCF31HZ-103A	CAPACITOR	0.01μF,50V
	C66	NCB31HK-102A	CAPACITOR	0.001μF,50V
	C67	QFV81HJ-103	TF CAPACITOR	0.01μF,50V
	C68	QETF1HM-105	E CAPACITOR	1μF,50V
	C69	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C71	QETC1HM-104	E CAPACITOR	0.1μF,50V
	C73	NCB31HK-681A	CAPACITOR	680pF,50V
	C74	NCT06CH-820A	CAPACITOR	82pF,50V
	L2	PU60025-1R2	COIL	1.2μH
	L3	PU60025-1R5	COIL	1.5μH
	L6	PU59152-6R8J	COIL	6.8μH
	L7	PU59152-6R8J	COIL	6.8μH

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	L8	PU59152-8R2J	COIL	8.2μH
	L9	PU59152-120J	COIL	12μH
	L10	PU59152-101J	COIL	100μH
	CF1	PU32990-2	CERAMIC FILTER	
	CF2	PU60774-2	CERAMIC FILTER	
	SAW1	PU35557-7	SAW FILTER	
	T1	PELN0444	IF.TRANSFORMER,VCO	
	T3	PELN0442	COIL,FM DET	
	T4	PELN0449	LC TRAP	
	SLD1	PQ33906-1-2	SHIELD PLATE	
	CN1	PEMC0825-009	B TO B CONN	
	CN2	PEMC0825-009	B TO B CONN	

****

AUDIO CONTROL HEAD BOARD <12>

	PWB1	PB40068	A/CTL HEAD PWB
	CN1	PU58844-107	CAP HOUSING

****

TIMER/DISPLAY/SW BOARD ASSEMBLY <21>

	PWBA	PB10504A-02	T/D/S BOARD ASSY
	IC1	UPD75216ACW-C03	IC
	or	UPD75P216ACWC03	IC
	IC2	IC-PST523H-2	IC
	IC101	GP1U541X	IR DETECT UNIT
	Q1	2SC3199(G)	TRANSISTOR
	or	2SC3311A(RS)	TRANSISTOR
	or	2SC536SPA(FG)	TRANSISTOR
	or	2SC1740S(RS)	TRANSISTOR
	D1	RD9.1ES-T1B2	ZENER DIODE
	D2	1SS133	DIODE
	D3	1SS133	DIODE
	D4	11ES2	DIODE
	D5	11ES2	DIODE
	D7	1SS133	DIODE
	D8	RD5.6ES-T1B2	ZENER DIODE
	D9	1SS132	DIODE
	D10	1SS132	DIODE
	D101	SLH-34VC3F	LE DIODE,POWER
	D102	SLH-34MC3F	LE DIODE,AUTO TRACKING
	D111	1SS132	DIODE
	D112	1SS132	DIODE
	D115	1SS132	DIODE
	D116	1SS132	DIODE
	D117	1SS132	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D118	1SS132	DIODE	
	D129	1SS132	DIODE	
	D140	1SS132	DIODE	
	R1	QRD161J-103	RESISTOR	10kΩ,1/6W
	R2	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R3	QRD161J-273	RESISTOR	27kΩ,1/6W
	R4	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R5	QRD161J-333	RESISTOR	33kΩ,1/6W
	R6	QRD161J-333	RESISTOR	33kΩ,1/6W
	R7	QRD162J-102	RESISTOR	1kΩ,1/6W
	R8	QRD161J-103	RESISTOR	10kΩ,1/6W
	R9	QRD161J-103	RESISTOR	10kΩ,1/6W
	R10	QRD161J-103	RESISTOR	10kΩ,1/6W
	R11	QRD161J-103	RESISTOR	10kΩ,1/6W
	R12	QRD161J-333	RESISTOR	33kΩ,1/6W
	R13	QRD161J-271	RESISTOR	270Ω,1/6W
	R14	QRD161J-271	RESISTOR	270Ω,1/6W
	R15	QRD161J-103	RESISTOR	10kΩ,1/6W
	R16	QRD161J-103	RESISTOR	10kΩ,1/6W
	R17	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R18	QRD161J-333	RESISTOR	33kΩ,1/6W
	R19	QRD161J-333	RESISTOR	33kΩ,1/6W
	R20	QRD161J-333	RESISTOR	33kΩ,1/6W
	R21	QRD161J-333	RESISTOR	33kΩ,1/6W
	R25	QRD161J-103	RESISTOR	10kΩ,1/6W
	R26	QRD161J-103	RESISTOR	10kΩ,1/6W
	R30	QRD161J-224	RESISTOR	220kΩ,1/6W
	R31	QRD161J-151	RESISTOR	150Ω,1/6W
	R32	QRD161J-271	RESISTOR	270Ω,1/6W
	R33	QRD161J-271	RESISTOR	270Ω,1/6W
	R34	QRD161J-333	RESISTOR	33kΩ,1/6W
	R101	QRD161J-271	RESISTOR	270Ω,1/6W
	R102	QRD161J-271	RESISTOR	270Ω,1/6W
	RA1	QRB077J-104	RESISTOR ARRAY	
	or	QRB079J-104	NETWORK RESISTOR	
	C3	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C4	QER61CM-106	E CAPACITOR	10μF,16V
	C5	QEA40HZ-105	E CAPACITOR (DOUBLE)	1F,5.5V
	C6	QAT3123-200	TRIMMER CAPACITOR,TIMER CLOCK	20pF
	C7	QCSB1HJ-120	CAPACITOR	12pF,50V
	C11	QER61CM-106	E CAPACITOR	10μF,16V
	C13	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C14	QER61HM-106	E CAPACITOR	10μF,50V
	C15	QCBB1HJ-101	CAPACITOR	100pF,50V
	C16	QCBB1HJ-101	CAPACITOR	100pF,50V
	C17	QCF11HP-473	CAPACITOR	0.047μF,50V
	C18	QER61CM-106	E CAPACITOR	10μF,16V
	C19	QER61CM-106	E CAPACITOR	10μF,16V
	C21	QCVC1CN-103	CAPACITOR	0.01μF,16V
	C22	QCC11EK-473	CAPACITOR	0.047μF,25V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	X1	PU60226-4	CRYSTAL RESONATOR
	S1	PU60392-2-2	TACT SWITCH,POWER
	S2	PU60392-2-2	TACT SWITCH,STOP
	S3	PU60392-2-2	TACT SWITCH,FF
	S4	PU60392-2-2	TACT SWITCH,REW
	S6	PU60392-2-2	TACT SWITCH,REC
	S7	PU60392-2-2	TACT SWITCH,PLAY
	S8	PU60392-2-2	TACT SWITCH,PAUSE
	S18	PU60392-2-2	TACT SWITCH,CLOCK ADJ
	S21	PU60392-2-2	TACT SWITCH,CANCEL
	S22	PU60392-2-2	TACT SWITCH,REPEAT
	S23	PU60392-2-2	TACT SWITCH,SELECT
	S24	PU60392-2-2	TACT SWITCH,TIMER
	S25	PU60392-2-2	TACT SWITCH,SET+
	S26	PU60392-2-2	TACT SWITCH,SET-
	S28	PU60392-2-2	TACT SWITCH,DISPLY OFF
	S29	PU60392-2-2	TACT SWITCH,SEARCH
	S30	PU60392-2-2	TACT SWITCH,CH SET
	S32	PU60392-2-2	TACT SWITCH,CNT/REM/DATE
	S405	PESW0550	SLIDE SWITCH,REPEAT
	FDP1	PEDP0039	FLUORESCENT DISPLAY PANEL
	CL1	PU56729-2	WIRE CLAMP
	HD1	PQ33662	FDP HOLDER(R)
	HD2	PQ33661	FDP HOLDER(L)
	HD3	PQM30038-2-2	LED HOLDER
	HD4	PQM30038-1-2	LED HOLDER
	CN1	PU61044-4	CONNECTOR
	CN2	PU61044-10	CONNECTOR

****

UPPER DRUM BOARD <41>

	PWB1	PDM3017	BOARD (UPPER DRUM)

****

PRE/REC AMP BOARD ASSEMBLY <43>

	PWBA	PB20548B-01	PRE/REC BOARD ASSY
	IC1	LA7375	IC
	Q1	2SA1309(RS)	TRANSISTOR
		or 2SA1267(G)-TJK	TRANSISTOR
	Q2	2SC1740S(RS)	TRANSISTOR
		or 2SC3199(G)	TRANSISTOR
	Q4	2SC1740S(RS)	TRANSISTOR
		or 2SC3199(G)	TRANSISTOR
	D2	1SS133	DIODE
		or MA165	DIODE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R2	QRD161J-821	RESISTOR	820Ω,1/6W
	R3	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R4	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R5	QRD161J-391	RESISTOR	390Ω,1/6W
	R6	QRD161J-391	RESISTOR	390Ω,1/6W
	R7	QRD161J-821	RESISTOR	820Ω,1/6W
	R8	QRD161J-562	RESISTOR	5.6kΩ,1/6W
	R9	QRD161J-272	RESISTOR	2.7kΩ,1/6W
	R10	QRD161J-621	RESISTOR	620Ω,1/6W
	R11	QRD161J-132	RESISTOR	1.3kΩ,1/6W
	R12	QRD161J-821	RESISTOR	820Ω,1/6W
	R13	QRD161J-681	RESISTOR	680Ω,1/6W
	R16	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R17	QRD161J-153	RESISTOR	15kΩ,1/6W
	R18	QRD161J-223	RESISTOR	22kΩ,1/6W
	R19	QRD161J-333	RESISTOR	33kΩ,1/6W
	R20	QRD162J-102	RESISTOR	1kΩ,1/6W
	R21	QRD161J-333	RESISTOR	33kΩ,1/6W
	R22	QRD161J-622	RESISTOR	6.2kΩ,1/6W
	R23	QRD161J-102	RESISTOR	1kΩ,1/6W
	R24	QRD161J-153	RESISTOR	15kΩ,1/6W
	R25	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R28	QRD161J-821	RESISTOR	820Ω,1/6W
	C2	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C3	QCSB1HJ-300	CAPACITOR	30pF,50V
	C4	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C5	QCSB1HJ-560	CAPACITOR	56pF,50V
	C6	QCSB1HJ-100	CAPACITOR	10pF,50V
	C7	QCBB1HJ-471	CAPACITOR	470pF,50V
	C9	QEK40JM-227	E CAPACITOR	220μF,6.3V
	C10	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C11	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C14	QFV11HJ-823	MMT CAP	0.082μF,50V
	C15	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C16	QFV11HJ-224	TF CAPACITOR	0.22μF,50V
	C17	QFV11HJ-224	TF CAPACITOR	0.22μF,50V
	C18	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C19	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C20	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C24	QCBB1HJ-820	CAPACITOR	82pF,50V
	C26	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C28	QEE40JM-475	TANTAL CAPACITOR	4.7μF,6.3V
	C29	QCSB1HJ-100	CAPACITOR	10pF,50V
	C30	QER60JM-476	E CAPACITOR	47μF,6.3V
	C32	QCBB1HJ-181	CAPACITOR	180pF,50V
	L3	PU59152-470J	COIL	47μH
	L4	PU59152-470J	COIL	47μH
	L5	PU59152-330J	COIL	33μH
	L6	PU59152-121J	COIL	120μH
	L7	PU54223-101K	COIL	100μH
	L10	PU54223-101K	COIL	100μH
	SLD1	PQ32216-1-1	SHIELD CASE(1)	
	TP3	PU60142-2	CONNECTOR	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	CN1	PU58844-105	CONNECTOR	
	CN2	PU59555-103	CONNECTOR	
	CN3	PU59973-4	CONNECTOR	

****

DECK TERMINAL BOARD ASSEMBLY <51>

	PWBA		PB10320E	DECK TERMINAL BOARD ASSY
	Q1		PU60625	END SENSOR
	R3		QRD161J-331	RESISTOR 330Ω,1/6W
	R4		QRD161J-331	RESISTOR 330Ω,1/6W
	R5		QRD161J-331	RESISTOR 330Ω,1/6W
	R8		NTH5D473KB	THERMISTOR
		or	ERT-D2ZHK473S	NEGA THERMISTOR
		or	NTH5D473KA	RESISTOR
	C1		QCVB1CM-103	CAPACITOR 0.01μF,16V
	PS1		PS5705HR	PH INTERRUPTER
	PS2		PS5705HR	PH INTERRUPTER
	CN1		PEMC0722-017	WIRE TRAP
		or	PEMC0753-017	WIRE TRAP
	CN2		PU60642	CONNECTOR(7PIN)
	CN3		PU60640	CONNECTOR(4PIN)

****

LOADING MDA BOARD ASSEMBLY <55>

	PWBA2		PB10320A2-01	LOADING MDA BOARD ASSY
⚠	IC1		BA6418N	IC
⚠		or	XRA6418N	IC
	C1		QETA1CM-336	E CAPACITOR 33μF,16V
	CN1		PU59555-104	CAP HOUSING

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	

****

CASSETTE HOUSING BOARD <56>

	PWB1		PB40061	CASSETTE HOUSING BOARD
	Q2		PN268VI	PHOTO TRANSISTOR
	D1		UZ5.1BSB	ZENER DIODE
		or	RD5.1ESB2	ZENER DIODE
	R1		QRD162J-473	RESISTOR 47kΩ,1/6W
	R2		QRD182J-681	RESISTOR 680Ω,1/8W
	R3		QRD122J-102S	RESISTOR 1kΩ,1/2W
	C1		QCC11EJ-103	CAPACITOR 0.01μF,25V
	PHS3		PU60629	CASS.SENSOR
	TH1		ERT-D2FHJ503S	THERMISTOR
	CN2		PU60639	4PIN SOCKET

SECTION 6
TECHNICAL INFORMATIONS

6.1 CPU pin functions

1. Mechacon CPU pin function (IC601)

Pin No.	Symbol	I/O format	Label	IN/OUT	Contents
1	Vcc	—	Vcc	—	For the SYSTEM CONTROL, DC 5V (AL 5V)
2	VREF	—	Vref		
3	DA	Analog	START SENS	I	LEADER TAPE DETECT (DET ON: L)
4	PWM	PWM	NC	—	NC
5	Port 6 4	N-ch OPEN DRAIN	FM DET	I	AUTO TRACKING DATA IN
6	Port 6 3	N-ch OPEN DRAIN	THERM	I	THERMIC CORRECTION (CAPSTAN BRAKE TIMING CONTROL)
7	Port 6 2	N-ch OPEN DRAIN	MODE SENS A	I	MECHANISM MODE DETECT
8	Port 6 1	N-ch OPEN DRAIN	MODE SENS B	I	MECHANISM MODE DETECT
9	Port 6 0	N-ch OPEN DRAIN	MODE SENS C	I	MECHANISM MODE DETECT
10	AN 7	Analog	REC SAFETY	I	DETECTS ERASE PROTECT TAB (TAB ABSENT: H)
11	AN 6	Analog	END SENS	I	TRAILER TAPE DETECT (DET ON: L)
12	AN 5	Analog	NC	—	NC
13	AN 4	Analog	CAP. V	O	CAPSTAN MOTOR DRIVE VOLTAGE SERVO
14	Port 4 3	N-ch OPEN DRAIN	DRUM. V	O	DRUM MOTOR DRIVE VOLTAGE SERVO
15	Port 4 2	N-ch OPEN DRAIN	LCM 2	O	LOADING MOTOR CONTROL
16	Port 4 1	N-ch OPEN DRAIN	LCM 1	O	LOADING MOTOR CONTROL
17	Port 4 0	N-ch OPEN DRAIN	DRUM FF	I	REC TIMING CONTROL, DRUM ROTATION DETECT (25 Hz)
18	Port 3 7	N-ch OPEN DRAIN	CTL PULSE	I	MODE DETECT (SP/LP), BLANK DETECT
19	Port 3 6	N-ch OPEN DRAIN	CAP REV	O	CAPSTAN ROTATION CONTROL (REV: L)
20	Port 3 5	N-ch OPEN DRAIN	V. PULSE	O	V PULSE CONTROL
21	Port 3 4	N-ch OPEN DRAIN	NC	—	NC
22	Port 3 3	N-ch OPEN DRAIN	NC	—	NC
23	Port 3 2	N-ch OPEN DRAIN	REEL FG (SP)	I	REEL ROTATION DETECT/TAPE REMAIN
24	Port 3 1	N-ch OPEN DRAIN	REEL FG (TU)	I	REEL ROTATION DETECT/TAPE REMAIN
25	Port 3 0	N-ch OPEN DRAIN	SYNC DET	I	INPUT SIGNAL DETECT (NO SYNC: H)
26	$\overline{\text{INT-1}}$	—	CAP FG	I	MODE (SP/LP) DETECT/BACK SPACE COUNT
27	CN Vss	—	CN Vss	I	GND
28	$\overline{\text{RESET}}$	—	RESET	I	RESET AT CONNECT VCR TO AC
29	X IN	—	X IN	I	MAIN SYSTEM CLOCK
30	X OUT	—	X OUT	O	MAIN SYSTEM CLOCK
31	ø	—	NC	—	NC
32	Vss	—	Vss	—	GND
33	Port 5 7	with Input Latch	R PAUSE	I	REMOTE PAUSE CONTROL (PAUSE ON: L)
34	Port 5 6	with Input Latch	INDEX	I/O	VISS DATA WRITE/DETECT
35	Port 5 5	with Input Latch	S. CLK	O	CLOCK
36	Port 5 4	with Input Latch	S. DATA	O	SERVO CONTROL DATA OUTPUT
37	Port 5 3	High Impedance	RENT	O	RENTAL MODE: L
38	Port 5 2	High Impedance	TEXT	O	TEXT MODE: L
39	Port 5 1	High Impedance	NC	—	NC
40	Port 5 0	High Impedance	EDIT	O	EDIT MODE: L
41	Port 1 7	N-ch OPEN DRAIN	REC START	O	REC START: L
42	Port 1 6	N-ch OPEN DRAIN	SP	O	SP MODE: L
43	Port 1 5	N-ch OPEN DRAIN	AUX	O	INPUT SIGNAL CONTROL (AUX: L)
44	Port 1 4	N-ch OPEN DRAIN	REC	O	REC: L
45	Port 1 3	N-ch OPEN DRAIN	P MUTE	O	PICTURE MUTE CONTROL (MUTE ON: L)
46	Port 1 2	N-ch OPEN DRAIN	EE	O	EE: L
47	Port 1 1	N-ch OPEN DRAIN	POWER ON	O	POWER ON: L
48	Port 1 0	N-ch OPEN DRAIN	VIDEO	O	VIDEO MODE: L
49	Port 0 7	N-ch OPEN DRAIN	A. MUTE	O	AUDIO MUTE CONTROL (MUTE ON: H)
50	Port 0 6	N-ch OPEN DRAIN	CASS SENS	I	CASSETTE IN/OUT DETECT
51	Port 0 5	N-ch OPEN DRAIN	M DATA	I/O	MEMORY IC CONTROL (DATA READ/WRITE)
52	Port 0 4	N-ch OPEN DRAIN	TNR CTL	O	TNR MODE: H
53	Port 0 3	N-ch OPEN DRAIN	V. UP	O	CAPSTAN ROTATION SPEED CONTROL (V. UP: H)
54	Port 0 2	N-ch OPEN DRAIN	NC	—	NC
55	Port 0 1	N-ch OPEN DRAIN	NC	—	NC
56	Port 0 0	N-ch OPEN DRAIN	M CE	O	MEMORY IC CHIP ENABLE
57	Port 2 7	C MOS	LP	O	LP MODE: L
58	Port 2 6	C MOS	NC	—	NC
59	Port 2 5	C MOS	PLL DATA	O	TUNING DATA OUTPUT
60	Port 2 4	C MOS	PAUSE	O	CAPSTAN MOTOR SERVO (SERVO MODE H)
61	Port 2 3	C MOS	SERVO	O	CAPSTAN MOTOR SERVO (SERVO MODE H)
62	Port 2 2	C MOS	T. CLK	I	CLOCK
63	Port 2 1	C MOS	T. DATA	I/O	M-CTL/TIMER CPU BUS DATA (16 BIT SERIAL)
64	Port 2 0	C MOS	PLL LOCK	I	TUNING CHECK DATA INPUT

Table 6-1 Mechacon CPU pin function

2. IC1 pin function (Timer)

Pin No.	Symbol	Label	I/O	Contents
1	S3	Sd	O	SEGMENT DISPLAY DATA OUTPUT /KEY SCAN PULSE OUTPUT
2	S2	Sc		
3	S1	Sb		
4	S0	Sa		
5	P00/INT4	POWER DOWN	I	POWER DOWN DETECT (P DOWN: L)
6	P01/SCK	OS CLK	—	NC
7	P02/SD	OS DATA		
8	P03/SI	TEST	I	TEST POINT (TP1)
9	P10/INT0	REMOTE	I	16 bit REMOTE DATA INPUT (A/B CODE)
10	P11/INT1	NC	—	NC
11	P12/INT2	CNT PLS	O	COUNTER DATA INPUT
12	P13/T10	CNT PLS		
13	P20	KS0	I	KEY SCAN DATA INPUT
14	P21	KS1		
15	P22	KS2		
16	P23/BUZ	KS3		
17	P30	TIMER DATA	I/O	TM (TIMER/M-CTL CPU) BUS : 16 bit SERIAL DATA
18	P31	TIMER CLK	I	: CLOCK
19	P32	SDA TA	I/O	VIDEO PROGRAMMING SYSTEM : I^2 C BUS DATA
20	P33	SCL K	O	: CLOCK
21	P60	NC	—	NC
22	P61	NC		
23	P62	NC		
24	P63	NC		
25	P40	NC		
26	P41	NC		
27	R42	NC		
28	P43	NC		
29	PP0	NC		
30	X1	X1	I	MAIN SYSTEM CLOCK
31	X2	X2	O	
32	Vss	Vss	—	GND
33	XT1	XT1	I	
34	XT2	POWER	O	LED CONTROL (LED ON: L)
35	P50	NC	—	NC
36	P51	AUTO TRACK	O	LED CONTROL (LED ON: L)
37	P52	NC	—	NC
38	P53	NC		
39	RESET	RESET	I	RESET AT CONNECT VCR TO AC
40	T0	10G	O	COLUMN DISPLAY DATA OUTPUT
41	T1	9G		
42	T2	8G		
43	T3	7G		
44	T4	6G		
45	T5	5G		
46	T6	4G		
47	T7	3G		
48	T8	2G		
49	T9	1G		
50	T10/S15/PH3	Sp	O	SEGMENT DISPLAY DATA OUTPUT /KEY SCAN PULSE OUTPUT
51	T11/S14/PH2	So		
52	T12/S13/PH1	Sn		
53	T13/S12/PH0	Sm		
54	T14/S11	Sl		
55	T15/S10	Sk		
56	VLOAD	VLOAD	I	FDP DRIVE
57	VPRE	VPRE		
58	S9	Sj	O	SEGMENT DISPLAY DATA OUTPUT /KEY SCAN PULSE OUTPUT /KEY SCAN PULSE OUTPUT /KEY SCAN PULSE OUTPUT /KEY SCAN PULSE OUTPUT
59	S8	Si		
60	S7	Sh		
61	S6	Sg		
62	S6	Sf		
63	S4	Se		
64	VDD	VDD	—	5 V For the SYSTEM CONTROL

Table 6-2 IC1 pin function

E. & O. E. No. 82235